

The United States MILLER

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MILWAUKEE, JANUARY, 1880.

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The Eureka Smut Machine Works.

MESSRS. HOWES, BABCOCK & CO. PROPRIETORS.

There are few actors in the milling world but have heard of the "Eureka Smut and Separating Machine," manufactured at Silver Creek, Chatauqua Co., N. Y. A brief account of the history and progress of the firm, a concise description of their buildings and of their manner of manufacture, and an expression of their prosperity must, therefore, be of peculiar interest to all.

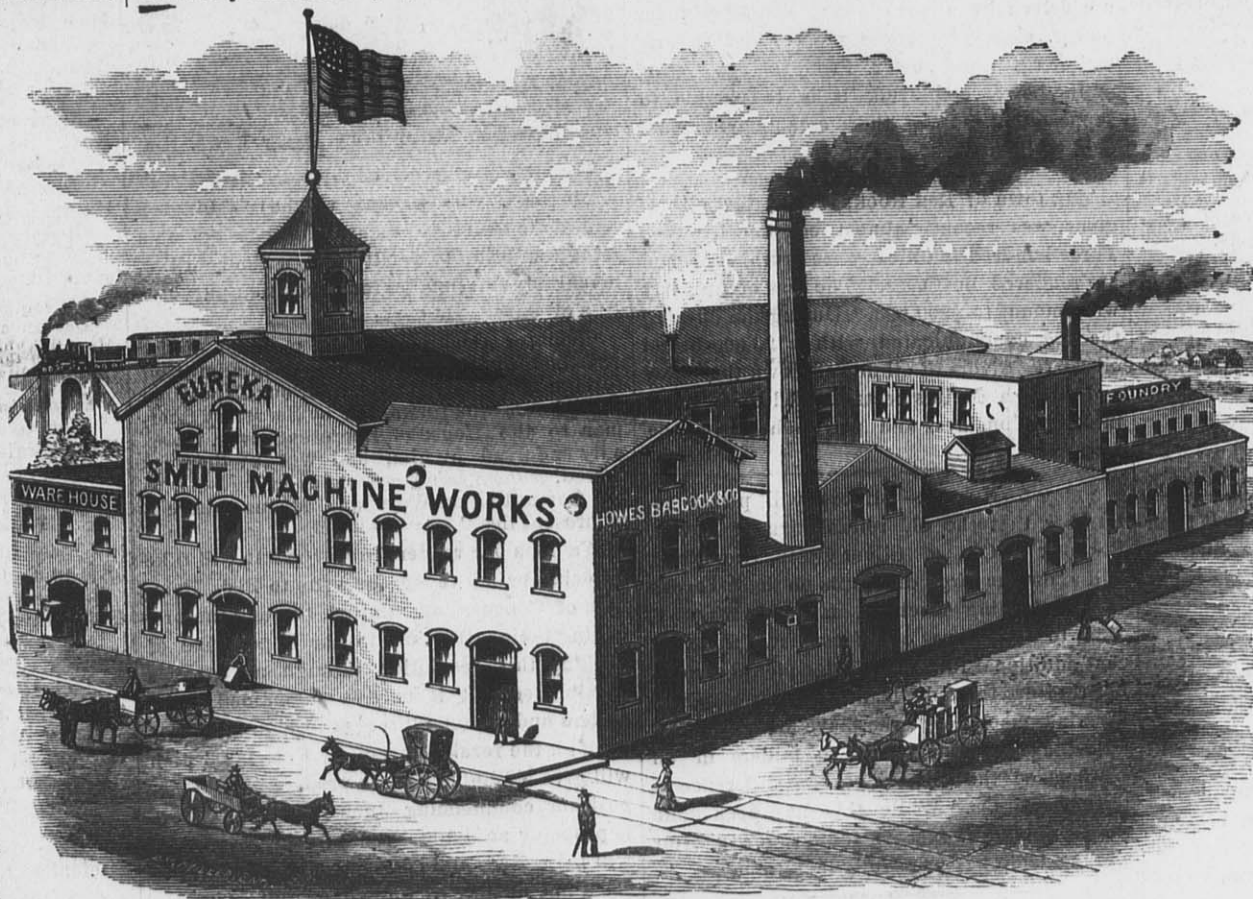
As one approaches the heart of this bustling little village, his attention is first attracted to a spacious brick building, bearing the sign: "Eureka Smut Machine Works. Howes, Babcock & Co." Entering this factory, he is impressed by the orderly activity of the hands, and their gentlemanly demeanor; while the constant loading, re-loading and shipping of machines, the unceasing stroke of hammers, and the whirr of machinery remind him that America is not at a stand-still. In examining the machines it is noticeable that every part is sound. This is because every part is made by the same firm. The foundry, the iron department, the smithy, the carpenter's room, and the varnishing shop, are all distinct and separate from each other. The workmen, to the number of '60 or 70, are experienced mechanics, and each one is especially adapted to his place. Thus the neatness and stability of all work from this manufactory are easily accounted for.

Let us look a little at the history of the firm. Established in 1856, the business has, from that time until the present, made rapid advancement in all its features, and, to-day, the company stands in the front rank of manufacturers of mill machinery. By means of inventive enterprise and growing financial strength, they have added to their resources, so that now they are able easily to furnish, completely, the best mills in the world. About a year ago they reduced, and made uniform, their prices, enabling the poorest millers to purchase the best machines. In this respect, as in all others, the firm is unequalled. Mr. Simeon Howes, the senior member of the company, was a member of the first firm, from 1856 to 1859, and then withdrew his connection with the business until the establishment of the present firm in 1864. Thus, for nearly fourteen years, its ability and renown have increased. The honesty and integrity of the members are as well-known as their names. Disdaining baseless exaggerations, they solicit milling authorities to investigate the worth of their machines. Remarkable for strength and simplicity, their work invariably proves to be more than satisfactory. Few manufacturing establishments of equal age can boast of so good a record. Their agents are honest and intelligent, and carefully shun all fraud. In times of almost universal failure, the prosperity of the company has but increased. The secret of their success is the true worth of their machines, a strict performance of all contracts, and attainable prices.

The Eureka Smut and Separating machine with which they began has been bettered by various improvements and additions, and is now accepted by the milling public as the best of its kind. But this is not the only machine made here. The Eureka Brush Finishing machine has no competitor in the market. The sectional arrangement of brushes, and the perfect method of ventilation, combined with the extraordinary stability of the work, give

it a position at the head. The Eureka or Booth's zig-zag separator is equally deserving of praise. This machine is built also for elevators and warehouses, having a capacity of from 100 to 1,000 bushels per hour. Another unrivaled invention is the Silver Creek Flour Packer, which all millers, upon trial, have declared to be an embodiment of value. Its peculiarly advantageous features are the receding platform, interchangeable tubes, and a friction regulating the pressure of the flour in packing.

Messrs. Howes, Babcock & Co. take especial pride in the Dufour and Dutch anchor bolting cloth, of which they are importers. Great care has been taken to secure the very best article. By means of certain patented attachments, their manner of making up bolting cloths has been rendered inimitable and unsurpassed. The Dutch anchor brand is undoubtedly excelled only by the Dufour.



HOWES, BABCOCK & CO.'S WORKS, SILVER CREEK, N. Y.

If there were no other evidence of the thrift and worth of the Eureka Company, perfect satisfaction would certainly be felt in the observation of their trade. Nearly every country on the globe imports their machines. Their work may be found in South America, England, Mexico, Australia, Canada, and in every State in the Union.

The past shows the perfect trustworthiness of this firm in all its departments. The faith which all customers have in the ability and integrity of Howes, Babcock & Co. gives assurance of all success in the future; while their fundamental financial soundness only makes "assurance doubly sure."

The Light for Flouring Mills.

Edison has at last perfected his wonderful electric light, which is simple, inexpensive and perfectly safe under any and all conditions. Light of great power can be furnished it is said for less than that now obtained from the cheapest illuminating oils. The following from the *Cincinnati Commercial* of December 23d sums up this wonderful discovery as follows:

"We were not speaking unadvisedly the other day, when we said that Edison had perfected his electrical lamp and made it a complete success. It will be recollected that a premature announcement of this discovery agitated England in the fall of 1878, and caused a panic among the holders of gas stock. This happened owing to the unauthorized publication of a few enthusiastic phrases

from a private letter. As a matter of fact, at that time Mr. Edison was far from the solution of the mystery of producing and diffusing light by electricity. He had not then earned the splendid success he has now achieved. Then there were interviews of Edison by enterprising newspaper correspondents of American and English journals, all expressing great expectations, and giving picturesque accounts of the mighty inventor and his mystical workshop. After a period of almost total silence, as Edison began to refuse to see interviewers, for the reason that they took time and strength, and committed him to inaccuracies that excited the mockery of men of science, we heard of the lamp in which platinum was employed, and its complex gearing to prevent the flow of too much electricity.

The general effect of this was to reduce the anticipation of Edison's success to a minimum. The panic in gas stock passed away altogether. The appeal to American miners to find enough platinum to make it a cheap metal excited amusement rather than alarm among the holders of investments in illumination. The point of the discovery we make known this

ments. One can produce a dazzling illumination without changing the temperature. As there is no combustion, there is no smoke, so that this is the light long sought for picture galleries. Wherever a wire can be stretched, light may be cheaply produced, so there will be no excuse for dark alleys. This will be the terror of burglars, for by the noiseless touching of a key, not only an apartment, but an entire house, may be instantly flooded with light, to the terror and discomfiture of all who seek darkness that they may do evil. It is a light that does not harm the eyes, and that may be shaded and regulated at pleasure—combining the softness of the oil lamp with the splendor of the burning of carbon points. The opinion is not entertained that an entire city could be supplied with electricity from a single establishment. New York, for instance, is to be divided into twelve districts, each receiving the magical current from an independent center. From four to six districts under this system would comprehend the compact portion of Cincinnati.

Edison's favorite theory on the subject is

that the gas companies will be glad to buy the right of lighting under his invention, and that the wires will be conveyed through the gas pipes, the new lamps being simply screwed on where the gas tips are found. Very fine insulated wire will suffice. All the appointments are simple. Agents are already here for the purpose of introducing the Edison lamp. The object is not to sell the right to individuals, but to employ capital in supplying districts. It is Edison's careful estimate that the cost of electric light, according to this system, will be something less than one-half the cost of coal gas. He is sure it will not exceed that figure. Beyond that, he promises to use electricity as a motor, to run sewing machines and the like and has prepared a meter for the exact measurement of the electricity furnished to each house. We need not dwell upon the importance of this discovery. It is revolutionary.

WHY WE BUTTER OUR BREAD.—

The layers of the wheat berry, as we proceed toward its center, become more and more completely starchy, and at the center but little else is found, and this portion makes our finest flour. The finer the flour, the less fit it is for nutrition. In its natural state, the wheat, with all its components present, is not fully fitted for

perfect human development. There is deficiency in the potential heat-producing materials, especially for cooler climates, there being only 2 per cent of fat in wheat. We instinctively supply this deficiency by the addition of fatty bodies. We spread butter upon bread, we mingle lard or butter with our biscuit or cake, and the fat meat and bread are taken alternately or coincidentally. The starch being a carbon-hydrate, can afford, comparatively, but little heat in consumption, and the fats are demanded by the wants of the system.

LEATHER COGWHEELS.—F. Kunkel, of Mezingen, in Wurtemberg, has patented a process for making toothed wheels of leather in place of metal. The advantages claimed for them are that they have a much quieter and more elastic run, are extremely durable, and require no lubrication whatever. They are prepared from raw untanned buffalo hides, thoroughly cleansed from all hair, flesh, etc., and glued together in as many layers as are necessary to produce the breadth of wheel required. The cementing is effected under very heavy pressure, as in a hydraulic press, and this is kept up until the glue has completely hardened. From the sheets or plates thus prepared the teeth are cut out by saw and chisel.

A two-run mill, with Atlas engine, is being built at Oak Grove, Kan., for Mr. Francis Thomas.

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, JANUARY, 1880.

THE UNITED STATES MILLER has now commenced its eighth volume, and has become universally acknowledged to be one of the most valuable milling journals in America, both for the purpose of transmitting knowledge on milling and mechanical subjects and as an advertising medium for introducing and selling all kinds of modern milling machinery. It is our aim to meet the wants of our patrons, whether manufacturers or consumers. Our editorial course will be entirely independent, and we shall do our best to give our readers the benefit of the latest important news on subjects pertaining to the objects of this paper. Our circulation and advertising patronage cover all sections of the country. We do not deal in machinery ourselves, and consequently have no "axes to grind." We cordially invite all those who have already patronized us to continue their patronage, and those who have not to try our columns. We append herewith our

ADVERTISING RATES FOR 1880.

	1 mo.	2 mos.	3 mos.	6 mos.	1 year.
One inch card	\$ 2 00	\$ 4 00	\$ 5 50	\$10 00	\$20 00
Two " "	4 00	8 00	11 00	20 00	40 00
Four " "	6 00	12 00	16 50	30 00	60 00
One-half col. (8 inches)	10 00	20 00	28 00	50 00	100 00
One-fourth page	20 00	40 00	56 00	100 00	200 00
One-half page	40 00	80 00	112 00	200 00	400 00
One page	100 00	150 00	200 00	400 00	800 00

Size of page, 12x18. Length of column, 16 inches. Width of column, 2 1/2 inches; 4 columns to each page.

Business editorial matter per line, 30 cents. If over 50 lines, 25 cents.

Illustrations charged for in proportion to space occupied.

Advertising for Millers wishing situations, or millers wanting to engage employees, 50 cents.

MILL FOR SALE advertisements, \$2 each insertion. Subscription price to the UNITED STATES MILLER, \$1 per year.

M'Lean's Millers' Text Book, which every miller should have. Price by mail, 60 cents, post paid.

Ropp's Easy Calculator, which every business man should have in his pocket or on his desk. Price by mail, post paid, FIFTY CENTS.

Our Job Printing Department is one of the finest in the State, and particular attention is paid to all kinds of commercial work, which we can do on the most reasonable terms. Parties desiring to publish catalogues, circulars, etc., should send for estimates.

Address all communications to the
 UNITED STATES MILLER,
 Milwaukee, Wis., U. S. A.

WE had the pleasure recently of a call from Mr. Edward Cooper, of Bishopstone, Sussex, England. He intends to remain in this country.

THE fifth annual meeting of Mill Owners' Mutual Fire Insurance Co., of Iowa, will be held in Council Chambers of Des Moines, January 21st, 1880, at 4 p. m.

MILL-OWNERS throughout the Northwest having old iron, metals, rags, rope, rubber, etc., will do well to read the advertisement of Wm. Franzen & Co., in another column.

IN the new advertisement of the Cockle Separator Mfg. Co. will be seen cuts of the medals awarded to the company for the best machine of the kind exhibited. A Cockle Separator is an absolute necessity in every flour mill.

BRAN BREAD.—Take a sponge of wheat flour, when it is light add salt and a small quantity of molasses, stirring in bran flour with a spoon until it is quite stiff. Let it rise and bake a little longer than the same size wheat loaf. This is very wholesome food.

BLAST FURNACES IN GREAT BRITAIN.—The Iron Trade Circular, of recent date, publishes a detailed list of the blast furnaces in and out of blast in Great Britain. The list is arranged by counties, and foots up—456 in blast, 493 out of blast, or a total 949.

WE call the attention of our readers to the advertisement of Wilhelm Braun, of Carlsbad, Bohemia, manufacturer of porcelain rollers and roller mills. Parties desiring to purchase porcelain rollers, or roller mills complete, would do well to correspond with him.

THE British Consul at Panama reports that india-rubber has almost ceased to be an article of export from the Isthmus, mainly in consequence of the great difficulty and expense of getting at the trees in the remote districts of the interior. Those nearer the coast have been destroyed by the wasteful system pursued

by the natives in cutting down the trees to procure the sap. In consequence, rubber belting, so much of which is now in use, has advanced greatly in price.

THE thermometer marked 56° below zero in Minneapolis, Christmas day. The latest telegrams stated that Hoppin had spliced on some gas-pipe to the present business end of his thermometer, and was contentedly awaiting the result of a further decline.

PARTIES desiring to subscribe for *The Miller*, London, England, can do so by either addressing this office, or writing direct to Wm. Dunham, Esq., No. 69 Mark Lane, London, E. C., England, and in either case enclosing \$1.50 by Post-office money order, or cash in registered letter.

THE patent roller case of R. L. Downton vs. Yaeger Milling Co., of St. Louis, is set for trial Jan. 8th, 1880, at St. Louis. Testimony in the case of Downton vs. Allis has lately been taken in the United States Court in Milwaukee. An early decision in these cases is expected.

BUCKWHEAT GROATS OR GRITS.—Many a miller owning a grist mill can make an honest penny by making buckwheat grits and introducing them in his neighborhood. Many have done so and built up a profitable trade during the winter, as they will sell at a fancy price. They make cakes superior to flour. Try them. Any mill can make buckwheat grits if they have the buckwheat.

IN Russia, at the present time, there are 205 distinct establishments engaged in the manufacture of agricultural machinery. Eighty are driven by steam power, seven by water power, ninety by horse power, and the remainder by hand power. From the description of the power employed, it is reasonable to suppose that most of these establishments are on a small scale.

THE town of Red Rock, Pa., in the oil regions, was recently almost consumed by fire. Three hundred families were burnt out and are rendered destitute. The loss of property will amount to \$200,000. During the burning the fire communicated with a 25,000-barrel oil tank. Rivers of oil flowed down the valley and through Main streets of Red Rock, burning all the business and private houses in the town.

SPECIAL NOTICE.—Millers will please remember that the old reliable firm of Hewes, Babcock & Co., of Silver Creek, New York, still allow the large discounts on their Eureka wheat cleaning machine, made January 1, 1879, to wit: 15 per cent from list, and 10 per cent additional for cash. Also please remember they are the only manufacturers of wheat cleaning machinery who have done this, establishing uniform prices to millers in all sections of the country, except difference in freight charges. While this has been done the reputation of these machines for superior workmanship has been fully maintained.

THE value of the bread and breadstuffs exported from the United States during the fiscal year ending June 30, 1868, was \$69,024,069; in the year 1877-78, \$181,177,841; and during the fiscal year of 1878-79, \$210,355,558. The exports of provisions increased in value from \$30,436,642 in 1868 to \$123,556,323 in 1879. There was a slight decline, caused mainly by the great decrease in prices during the fiscal year ending June 30, 1879, the value of the provisions exported during that period being \$116,858,650. As a very large proportion of the breadstuffs and provisions exported, during the last fiscal year, which had an aggregate value of \$327,214,178, were brought by the railways from distant western and north western portions of the country to the Atlantic seaboard, they furnished an amount of traffic to the railway system of the country which has formed a leading influence in promoting its recovery from the depressing influences of the panic.

HON. GEO. BAIN, of St. Louis, the energetic president of the *Millers' National Association*, has "put his hand to the plow," so to speak, in the interest of the *Millers' Exposition* at Cincinnati, and is determined to leave nothing undone that can be done to make the Exposition a tremendous success. He has journeyed thousands of miles, running the risk of losing his life by railway accidents, being burned up in hotels, etc., has talked so eloquently with the railway and steamboat managers as to bring them to proper terms, and has even been to Washington and beard the presi-

dent, secretaries and the American Congress in their "dens" and after these arduous labors has just returned to his home to enjoy the holidays. His soul is in the work, and he will be entitled to all the honor and credit he is likely to get for the success of the Exposition. Secretary Seamans and Assistant Secretary Mills, of Milwaukee, are diligently at work answering correspondence and making and carrying out various plans in the interest of the *Millers' Association*, and are doing all in their power to help the cause along. Cincinnati feels jubilant over the occasion, and her citizens have done and will do everything in their power to make the *Millers' Exposition* for 1880 one of the most pleasing and memorable events in her history.

THE Chief of the Bureau of Statistics furnishes the following information derived from official returns in regard to immigration into the port of New York: There arrived at the port of New York during the month of November, 1879, 18,005 passengers, 15,295 of whom were immigrants. During the corresponding period of 1878 the total number of passengers arriving at the port was 8,885, of whom 5,852 were immigrants. Of the total arrival of immigrants at the port during the month of November, 1879, there were from England, 3,487; Scotland, 676; Wales, 155; Ireland, 1,962; Germany, 3,731; Austria, 463; Sweden, 1,176; Norway, 393; Denmark, 225; France, 228; Switzerland, 219; Italy, 1,544; Holland, 182; Russia, 282; Poland, 49; Hungary, 441; all other countries, 82. The arrivals at the port of New York during the twelve months ended November 30, 1879, as compared with the corresponding period of 1878, were as follows:

	1879.	1878.
Citizens of the U. S. returned	31,782	33,807
Sojourners	5,965	5,836
Immigrants	134,058	81,225
Total	171,835	120,988

Foreign Machinery Duty Free.

We have just received a letter from President Bain, who recently visited Washington and made efforts to secure the passage of a joint resolution to admit foreign flour milling machinery and supplies for Exposition purposes free of duty. He says:

"Senator Cockrell advises me that on the 18th inst. my petition in regard to admitting foreign machinery intended for our Exposition free of duty was forwarded by Secretary Sherman to the House of Representatives, favorably endorsed by him, and was by them referred, without being ordered to be printed, to the Committee on Ways and Means, where it at present lies."

We hope our readers in every State will take especial pains to see or write to their Members of Congress and United States Senators, calling their attention to the importance of pushing this resolution through as early as possible, so that it may be announced to the millers and manufacturers of foreign countries through the foreign press by Feb. 1st, which will give all ample time to prepare for the Exposition commencing June 1st, 1880. There is probably no doubt but that the resolution will be passed, and consequently we expect to see a fine display by foreign exhibitors.

Flour Manufacture in Milwaukee for 1879.

During the year 1879 nearly 200,000 barrels of flour (196 pounds to the barrel), more were manufactured in Milwaukee, than in the year 1878, and more than was ever manufactured in one year before in this city, notwithstanding the enforced idleness of the mills part of the time, caused by the speculative price of wheat and stoppages for extensive repairs and additions. The amount in barrels (196 pounds), for the five years 1875 to 1879 inclusive is as follows:

Mills.	1879.	1878.	1877.	1876.	1875.
Eagle	144,500	116,484	140,200	160,000	150,000
Reliance	23,000	28,500	73,000	70,000	115,000
Empire	52,972	46,315	73,000	80,000	57,400
Phoenix	135,000	125,000	97,942	128,731	120,000
River St.	40,000	26,250	30,579	34,400	150,800
Ontario	17,500	33,200	48,500	44,355	51,200
Cream City	43,000	26,000	20,100	12,000	14,000
Kilbourn	5,000	12,000	20,000	35,000	30,000
City	38,461	36,652	43,280	41,605	25,561
Northwestern	5,000	500	6,000	20,900	6,400
Upper	5,000	10,000	3,000	8,000	23,065
Mil. Milling Co.	112,500	18,000	2,500	2,500	
Star	84,000	55,000	22,100		
Gerlach & D.	51,000	40,156			
Total	752,133	555,049	561,201	647,581	740,526

Another 600 barrel mill will be ready for operation in February, 1880, and a smaller one a little later, which will increase our capacity for manufacture considerably in the year 1880.

A FIRE has been raging in a dried-up slough near Whitfield, Minn., for three months past, and shows no signs of abatement. One old settler in the vicinity has ventured the opinion that "hell has broke loose."

Fifth Semi-Annual Convention of the Pennsylvania Millers' State Association.

(Official.)

SECRETARY'S OFFICE, Selinsgrove, Pa., January 1, 1880.

The Fifth Semi-Annual Convention of the "Pennsylvania Millers' State Association," will be held at Lechiel Hotel, Harrisburg, Pa., on Tuesday, January 13th, next, at 3 o'clock, P. M. It is hoped that all interested in the industry will present themselves, as a most interesting and profitable time is anticipated. Important business will be presented, among which is the making of arrangements to have the State creditably represented at the coming Millers' International Exposition, at Cincinnati, Ohio, in June next. The Officers for the ensuing year will be elected. The propriety of changing the time for meetings will be considered. Excursion tickets will be issued by the P. R. R., N. C. R. R., P. & E. R. R. and P. & R. R. R. Apply to the Secretary for orders.

CHARLES A. MINER, Pres.,

Wilkesbarre, Pa.

A. Z. SCHOCH, Sec'y.

Recent Patents.

The following patents of interest to the milling trade were issued from the U. S. Patent Office, Dec. 2d, 1879:

Flour sifter—Fred. G. Ford, Philadelphia.
 Fanning mill—E. M. Gilbert, Byron, Minn.

PATENTS ISSUED DEC. 9, 1879.

Millstone dressing machine—Thomas P. Benton, LaCrosse, Wis.

Current water wheel—J. J. Collins, South Bend, Ind.

Millstone driver—Wm. Johnson, Milwaukee, Wis.

Grinding machine—Louis M. Seifert, Gladbach, Prussia.

Oatmeal machine—F. Schumacher, Akron, Ohio.

PATENTS ISSUED DEC. 16, 1879.

Water wheel—Walter B. Allred, High Point, N. C.

Elevator bucket—W. J. Clark, Salem, Ohio.

Disintegrating grain—Lewis J. Cox, Terre Haute, Ind.

Grain separator—A. Fugel, Clayton, Cal.

Magnetic grain separator—D. D. Hardy, Delavan, Ill.

Corn sheller—James Hawley, Odin, Ill.

Device for dressing millstones—G. W. Jones, Mansfield Valley, Pa.

PATENTS ISSUED DEC. 23, 1879.

Grain meter—W. H. Allen, New York, N. Y.

Water gate—Philip S. Basnett, Basnettville, West Virginia.

Roller grinding mill—Wm. D. Gray, Milwaukee, Wis.

PATENTS ISSUED DEC. 30, 1879.

Grain troller.—Henry E. Douglas, New Brighton, Pa.

Apparatus for handling and moving grain.—Philip Ely, New York, N. Y.

Mill stone pick hammer.—Chas. T. Farnham, Lawrence, Mass.

Apparatus for degerminating grain.—Jonathan Mills, Milwaukee, Wis.

Bran cleaning machine.—Jonathan Mills, Milwaukee, Wis.

Burr for grinding mills.—Geo. and A. Raymond, Waupun, Wis.

Water wheel.—Stephen M. Smith, York, Pa.

Grain decorticating apparatus.—Franz X. Stiefenhofer, Cherryvale, Pa.

Bran scouring machine.—Wm. C. Turner, St. Louis, Mo.

Grain separator.—William Workmann, De Pere, Wis.

WHEN a life insurance agent comes in and tells us that only last week a man insured with him for \$20,000 and paid one premium, and to-day he is dead and his family has the money, it doesn't make us any more anxious to insure, though it may be a convincing argument in favor of the beauties of the system.—*Boston Post.*

AT Newburyport the other day, says the *Herald*, an Englishman and a Yankee engaged in a game of brag. "Well," said John Bull, "we can beat you on guns. We have a gun at the Woolwich Arsenal than when it is fired the report is 'eard in Australia.'" "Guns," said the Yankee, becoming excited and jumping to his feet, "guns, why we have a gun here in America that was fired off in 1776, and you Englishmen hain't heard the last of it yet."—*Boston Journal.*

Ewd. P. Allis & Co., of Milwaukee, Wis., have in their shops, in various stages of completion, eighteen Reynolds-Corliss engines, among them a 24x60 for the Winona Mill Co., of Winona, Minn.; a 26x48 for the Whitbeck Lumber Co., of Marinette, Wis., and another of same size for C. Lamb & Son, Clinton, Iowa; a 28x60 for the Valley Lumber Co., of Eau Claire, Wis.; a 28x48 for J. W. Young, of Clinton, Iowa, and a 28x60 for Bernhard Steven, of Milwaukee. They have also a large number of their independent condensers under way.

Hafner's Equilibrium Driving Pulley for Mill Spindles.

The attention of millers and millwrights has often been called to the serious difficulty of keeping the mill spindle in tram, owing to the side pressure or strain of the driving belt or gear. With gearing of course the pressure was less than the pull of a quarter twist belt, but the majority of millwrights have decided in their own minds that the use of belts for driving mill-stones is far preferable to that of gearing, owing to the absence of backlash and the consequent smoothness of the motion. The one serious defect to be overcome in the use of belts is the side pull of the belt, which soon pulls the spindle out of tram. The constant spring of the spindle makes it continually out of tram, so that perfect work by the burrs is impossible. Many devices have been tried to overcome this obstacle, the latest of which is illustrated herewith, and which is the invention of Mr. Jao. A. Hafner, of Pittsburgh, Pa., well known to the millers of this country as the inventor and manufacturer of the celebrated Eureka coil spring for mill spindles, a device which is used in a great many mills, and always with the best satisfaction. Mr. Hafner has made the problem of driving the mill-stone in the best manner his especial study for a good many years, and this invention is one which he believes solves the problem perfectly and leaves nothing more to be desired. The devices will be understood by the following description and explanation of the accompanying cut:

The lower end of the spindle is shown. A A is the hub of the driving pulley which takes the place of the ordinary pulley on the mill spindle. The outside of the hub, A A, is turned and runs in the bearing, B B, which is a part of the bridge tree and is made so that it can be taken up to compensate the wear. It will be noticed that the arms of the pulley which are fastened to the hub near the top curve down so that the center line of the pulley and the center line of the bearing come in the same line, so that the pull of the belt is square against the bearing B B. The mill spindle, C, passes through the hub of the pulley and is independent of it, the spindle being smaller than the bore of the hub. The spindle rests on the step, G, which is raised and lowered by the lighter lever, H, as is ordinarily the practice. The connection between the hub, A A, and the spindle, C, is made by means of the universal driver, E, and Eureka coil spring, D, thus ensuring a positively even transmission of the driving power from the pulley to the spindle, and at the same time there is not a particle of pull or strain on the spindle from the belt. The step, G, is made oil tight in the bridge tree by means of the packing, K, and the bearing is supplied with oil through a tube surmounted with an oil cup. The upper part of the tube, J, is made of glass so that at all times the quantity of oil in the bearing may be seen. The hub, A A, rests on the step, F F.

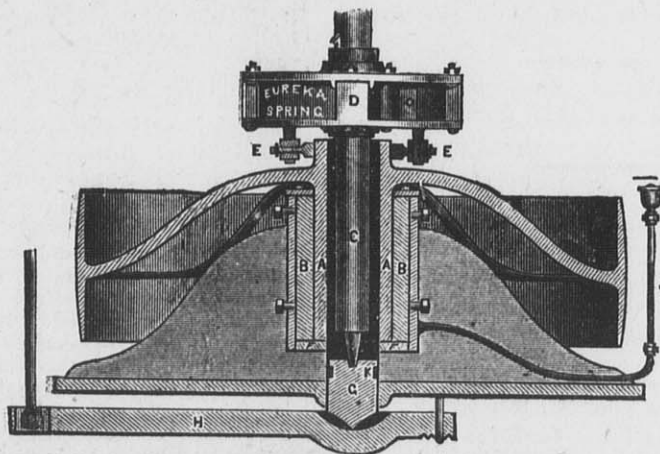
Mr. Hafner had a model of this system of driving mill stones on exhibition at the recent meeting of the Illinois Millers' Association at Springfield. Those of our readers who were at the last meeting of the Millers' National Association, will remember the model of his mill fitted up to show the comparative advantages of driving by belt and gears. He has also invented another system of driving mill stones which does away with all side pull on the spindle, and is now at work making a model for the same. He will have working models of all his inventions (that of the equilibrium driving pulley will be full size) on exhibition at the Millers' International Exhibition next June. Those who wish further particulars concerning any of his machines may obtain full information by addressing the inventor, Mr. John A. Hafner, 39 Water street, Pittsburgh, Pa.

Seck's Improved Self-Acting Mill-Stone Exhaust.

[A paper read before the National Association of British and Irish Millers, Dec. 8, 1879.]

Mr. Brandstaetter read the following paper: Mr. President and gentlemen: Without doubt the milling industry is one of the grandest in the world. To it mankind is indebted for its very existence. Nature provides us with the wheat, the mill, the flour, and in flour we have the staff of life. And whilst well supplied with this commodity, we need not fear the lack of nourishment for the support of our ever-wasting frames. It is natural, therefore, that this great industry should receive our very best attention, and that our endeavors should aim at proficiency in this as in other manufactures. Many improvements have been introduced into this country, as in others; some to be brought more or less extensively into use, others to remain practically unknown. One of these inventions, which

has obtained an almost universal attention, is the Exhaust. If I am not misinformed, it was first introduced into this country as a patent on the 11th of August, 1846, and was known as Newton's patent, and the system has been more or less in use ever since. It has done noble work, but unfortunately it has also been the cause of the destruction of much life and property. I believe all the gentlemen here are aware of the great benefits to be derived from the exhaust, and likewise of the danger which is more or less attendant on its use. Of the latter I can speak from personal experience, having been unfortunate enough to have had three explosions, though I had used the utmost precautions to prevent such a misfortune. There are several ways that an explosion can arise, but an explosion in flour can only arise through a flame, and not through a spark, as in gunpowder. Firstly, this flame can arise through the millstone running empty; secondly, through a nail (which, if the stone is not properly balanced, will strike fire at once) or any other fragment of iron going between the faces of the millstones; and, thirdly, and the worst, through the small stones which are found in foreign wheats. These are very dangerous, as some of them are very hard, and when they come between the faces of the millstones they elevate one side of the stone; the other side then gets too much face to face, and naturally strikes fire. Also the small hard stones themselves, being ground between two French burr stones, will strike fire, and the elevation of the stone causing a large opening on the one side there is the chance of a large flame at once rising, which is then conveyed into the pipes and trunk, where it always finds sufficient dust to feed it until it passes through the fan into the exhaust room, where in most cases an explo-



Hafner's Equilibrium Driving Pulley for Mill Stones.

sion takes place, as there is generally sufficient dust about. In 1872, there was an explosion in Messrs. Muir's Mills, at Glasgow, and only too many others that could be named, all arising from one source—the exhaust.

Gentlemen, I now wish to bring to your notice a New Improved Self-Acting Millstone Exhaust, invented by Mr. William Seck of the firm of Messrs. Seck Brothers, of Bockenheim, near Frankfurt-on-the-Maine, Germany. By the adoption of this exhaust apparatus the danger of fire or explosion, so far as connected with the millstone, is entirely removed, every single framework being provided with a filter or flannel, which prevents the flour dust from penetrating into the exhaust tubes; the air sucked into the tubes, therefore, is quite free from dust, and the necessity of a dust chamber is consequently disposed of, the exhaust leading the air sucked to be blown directly into the open air. The dangerous exhaust room is entirely done away with, and should it be the case that any stone should strike fire it would not do any damage, as the fire could only get into the main pipes and only go through the fan to be blown out into the open atmosphere, where it would die out, and an explosion in the pipe could not take place, as before stated, there being no flour in the pipes, so there is no danger left. The exhaust can also be made to work in connection with the blast (or, I may better say), blowing air into the eye of the millstone. But this, I have proved, is not required; the wheat can be ground quite as cool without it, and you could still grind from 6 to 14 bushels per hour, according to the size of the stone. The apparatus is perfectly self-acting, requiring no extra attention, and it certainly has all the benefits advanced in favor of similar appliances, besides having its own peculiar benefits derived from its being airtight, and the passing of the air through the eye of the millstone, thence between the faces of the stones, thus keeping them cool. As long as the stones are kept cool they remain sharp, and the longer they are sharp the longer will they produce a sharper, whiter, and stronger flour. So long as the stone is cold it grinds much keener, therefore you can grind more with the same power. There is not much steam produced with this exhaust; little or no sweat arises, thus there is a complete avoidance of fermentation and paste. I do not know if all the gentlemen here are aware of the fact that most of the present exhaust flour, which is sucked into the pipes, trunks, and exhaust room ferments, and is through that damaged. The fermentation arises from wood and steam. The wood gets wet by the steam, which it is understood comes from the millstone, and as the flour lodges in the pipes, trunks, and exhaust room, it remains there in most cases 12 hours, and during this time it ferments, and is then more like starch than flour. The air tubes being in this case perfectly free from flour, there is not one pound of damaged flour produced in a month. When the clockwork apparatus is put into motion, and the shaking takes place,

there is a valve in the exhaust pipe, which, previously to the shaking, closes. This valve is one of the most particular points in this invention. Firstly, if the valve was not shut and the shaking went on there would be a chance of flour dust being sucked in the pipes and fan and blow out, which would be a dead loss; secondly, if the valve were open during the shaking operation, the shaking could not possibly be properly done, and the sucking of the air would keep up the flannel and frame work, and would not let the flour shake off; but when the valve is shut, it shakes off freely, and the dust falls back into the meal. The valve opens as soon as the operation ceases. This shaking operation takes place at intervals of from 5 to 10 minutes, as may be desired. There is a model here for inspection, and I shall have much pleasure in explaining its various details to any of the gentlemen present.

Janesville, Wisc., Mills.

MESSRS. BARNES & HODSON, PROPRIETORS.

Messrs. Barnes & Hodson have been recently rebuilding, enlarging, and refurnishing their flouring mill at Janesville, Wisc. The reporter of the *Janesville Recorder* recently visited the mill and the following report is published for the enlightenment of its readers:

"The frame work of the building being considered too weak to bear the strain which would be placed upon it when the new machinery, which they proposed placing in the mill, was put in position, and the building needing at the time extensive repairs, it was thought best to start at the foundation and rebuild with larger and stronger timbers, and at the same time re-arrange the shafting and machinery.

would prove a valuable auxiliary to the fire department in the event of a fire in the immediate neighborhood of the mill, and should a fire occur in the mill the person on duty could have it extinguished before an alarm could be given to the firemen. Much credit is due Mr. George Butler, the efficient millwright, who had the direction of the repairs for their successful completion. He has shown rare mechanical genius in the arrangement of the machinery and proven himself a thorough master in his business.

Messrs. Barnes & Hodson have spared neither pains nor money in repairing and refitting their mill, and now it is safe to say that they have one of the finest equipped mills in the West, and that the grades of flour manufactured here cannot be excelled anywhere.

Chicago's Grain Storage Capacity.

The completion of Messrs. Armour, Dole & Co.'s new elevator, which was inspected by a large number of representative business men of Chicago the middle of last week, adds an additional 2,000,000 bushels to the storage capacity in this city, and gives us a total storage capacity of 17,150,000 bushels. The house just completed by this enterprising company is 386 feet long, 100 feet wide and 145 feet high, and makes three large elevators now owned by this firm. This last one is the largest elevator in the world, but we believe that Baltimore, Philadelphia and New York are now building elevators of like capacity. The cost of the new structure was \$350,000, and the grain it will contain is received from the line of the Chicago, Burlington & Quincy railroad. The following is a brief description of this mammoth structure:

The elevator is situated at the corner of Morgan and Twenty-second streets. Its dimensions are as stated above. There are three lines of shaft on the upper floor, doing away with driving belts. The appliances for the extinguishment of fire are perfect. There are twenty-six elevators for the hoisting of grain, each of these being supplied with a steam injection. In case of fire the flame can be instantly extinguished with steam. There are twelve connections with the stand-pipes, so that the facilities for throwing water are ample. The iron shutters at the sides of the building may be closed in an instant by the simple manipulation of a crank of one-man power. Not the least interesting feature about the machinery of this concern is a belt which is fifty inches in width and two hundred and eighty feet in length. It is the largest belt in the world. The machinery and other facilities are adequate for unloading 500 cars per day, and also loading the same number.

Chicago has now a greater number of elevators of large capacity than any other city in the world. There are four elevators of a storage capacity each of 1,000,000 bushels; two of 1,500,000 bushels each; one of 1,250,000 bushels; one of 800,000 bushels; three of 700,000 bushels each; two of 500,000 bushels; and five others with a capacity varying from 350,000 down to 100,000 bushels—making the total number of the elevators in Chicago twenty-one, with their full capacity, as already stated, at 17,150,000 bushels. We need not here enter into a history of the grain trade of Chicago. The time does not date back but a few years when Chicago was a point merely for the trans-shipment of grain; now it is an accumulative point from which any retrogression is out of the question. The course of commerce is East and West, and Chicago, with her grand system of railroads reaching out to the richest agricultural regions on the face of the globe, holds within her grasp, as firmly as with a vice, the reins that control, and must control for many long years to come, the grain traffic of the Northwest. The completion of the jetties at the mouth of the Mississippi river, the construction of wooden or iron barges for the transportation of grain to New Orleans—none of these things alarm her in the least. She knows that her enterprise and geographical position make her supreme.—*Chicago Journal of Commerce*.

Messrs. Allis & Co. report that the demand still continues for roller mills, engines and machinery to such an extent that they are continually adding new tools, and shall soon build a complete new foundry 100x300 feet, using the old foundry as an erecting shop and store-room. They have now nearly 700 men on the pay-roll, and are running night and day.

Minnesota and Iowa millers are complaining of a dearth of water.

The elevator built by the Red Wing Mill Company at St. Vincent, Minn., is complete and now in operation.

Sidle, Fletcher, Holmes & Co., of Minneapolis, are putting in the Allis rolls.

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 We wish them to consider the receipt of a
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 to become regular subscribers. We are
 working our best for the milling interest
 of this country, and we think it no more
 than fair that our milling friends should
 help the cause along by liberal subscrip-
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We respectfully request our readers when they
 write to persons or firms advertising in this
 paper, to mention that their advertisement was
 seen in the UNITED STATES MILLER. You will
 thereby oblige not only this paper, but the ad-
 vertisers.

FLOATING grain elevators are about to be
 introduced into England.

An elevator was recently constructed in Chi-
 cago which has a capacity for 1,800,000
 bushels. It was ready for business on the 1st
 inst., and with this addition the total capacity
 of the Chicago elevators is 16,955,000 bushels.

The Millers' Exposition for 1880.

There is now no one who doubts the great
 success of the coming Millers' Exposition,
 which will commence June 1, 1880, at Cincin-
 nati. Already a great amount of space in the
 Exposition building has been taken and the
 applications are daily pouring in from all
 points of the compass. The British and Irish
 Millers' Association is heartily interested in it,
 and a great number of its members will visit
 this country on that occasion. The foreign
 milling press, English, German and French,
 has taken especial pains to bring the matter
 prominently before their readers. There seems
 scarcely a doubt but that Congress will at
 once pass a joint resolution permitting the im-
 portation of foreign milling machinery and
 products for exhibition free of duty as was
 done at the great Centennial Exposition at
 Philadelphia in 1876. That this exhibition
 will be a success and will be of great import-
 ance to the milling industry throughout the
 world cannot be denied. Satisfactory arrange-
 ments for the cheap transportation of passen-
 gers and freight for this occasion by water
 and rail have been effected. The people of
 Cincinnati show the most liberal spirit, and all
 visitors may expect the most cordial welcome
 and hospitable treatment whether from our
 different States or from foreign shores.

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 NOT ALREADY A PAID SUBSCRIBER.

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 greatest possible use and benefit to the milling
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 and the UNITED STATES MILLER, for one year,
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 for \$1.25. Price of Text Book alone, 60 cents.
 Send cash or stamps.

Longmont, Col., is soon to have a new grain
 elevator.

J. W. English & Bro. have opened a mill
 furnishing house at No 1231 Union avenue,
 Kansas City, Mo.

Immigrants continue to pour in upon us
 from Europe. Three times as many arrived
 in New York during November last as for the
 corresponding period of 1878. For the year
 ending with November there were 181,000 im-
 migrants, as against 120,000 for the preceding
 twelve months.

[From Thomas Wright, Mill Hollow, Pa.]

"Business is in a better condition here now
 than it has been for three years past. Many
 mills have been remodeled, but few new ones
 have been built in this vicinity.

A MINNEAPOLIS, Minn., correspondent says:
 The "Victor Heater," manufactured by the
 Victor Heater Co., (J. W. Birdwell, general
 agent,) of Minneapolis, is meeting with very
 large sales, having placed over 100 machines
 in mills in the United States in the last two
 months, and that the heaters are giving uni-
 versal satisfaction. They are simple and dur-
 able, easily managed, and do thorough and
 perfect heating. The Victor Heater Co. is
 engaged now in the manufacture and sale of
 Samuel Potts' Process Patent, for effectually
 removing the germ and fuzz or fiber found in
 wheat before grinding, making milling much
 more simple, and saving a great deal of clean-
 ing machinery. This process is working suc-
 cessfully in a number of the best mills in the
 State. This company is also manufacturing a
 new granulating mill, invented by Mr. Samuel
 Potts of Minneapolis. This mill has shown
 some of the best work of anything yet brought
 out, both as to quality and quantity. A three
 foot stone will granulate more and give a bet-
 ter percentage of middling than two run of four
 foot stone grinding the ordinary way. We
 have made 93 to 95 per cent of middlings
 from spring wheat, and will have cleaner bran
 with two operations than rolls or stone will in
 from four to six operations. Parties con-
 templating making changes in their mills, or
 who are going to build, will do well to write
 for full information in reference to those im-
 provements. Address all communications to
 Victor Heater Co., Minneapolis, Minn., J. W.
 Birdwell, General Agent.

National Association of British and
Irish Millers.

[We are enabled to furnish this report in
 this number by the courtesy of the editor of
 the Corn Trade Journal and Millers' Gazette of
 London, who has furnished us proof-sheets in
 advance of publication.]

A meeting of the members of this Associa-
 tion was held on Monday, December 8th, in
 the Bakers' Hall, Harp Lane. Mr. Alderman
 Hadley, the President of the Association,
 took the chair, and there were also present
 between 60 and 70 members.

The President, in opening the proceedings,
 said: Gentlemen, we will proceed now with
 the business, but before calling upon the
 respective gentlemen to read their papers to
 you, I will request the secretary to read one or
 two communications we have received from
 America with reference to the approaching

Millers' Exhibition at Cincinnati. It is under-
 stood that the exhibition will be of a very in-
 ternational character, and our friends who
 flourish on the other side of the Atlantic are
 anxious to have the co-operation of the British
 and Irish Millers, and I understand there is
 some project in view as to the formation of a
 deputation of millers, in connection with our
 Association, to visit America during the ap-
 proaching summer. I believe that Messrs.
 Throop and Thayer are willing to undertake
 the management of a party to visit the States,
 and our Secretary will also be willing to give
 any information required. We are also asked
 by the American Association whether or not
 we can exhibit machinery in America. Now
 I have no doubt that all our machinists would
 be only too glad, and would readily respond to
 the invitation from our brethren, but unfortun-
 ately it is rendered almost impossible—if not
 quite,—in consequence of the very excessive
 prohibitory tariff upon all machinery that is
 made in this country and exported to America.
 We regret this, but until those tariffs are
 modified, or until some different interchange
 occurs, it is quite impossible for our machin-
 ists to avail themselves of the kindly disposi-
 tion and accede to their request. I hope this
 fact will be made known. Perhaps I had
 better let the letters that have been received
 be read, so that it may appear in its proper
 place, therefore I will call on the secretary to
 read the letters, and then we will proceed with
 the business of the day.

Mr. Chatterton, the secretary of the Asso-
 ciation, then read the following letters:

MILLERS' NATIONAL ASSOCIATION,
 Milwaukee, Wisc., Nov. 7, 1879.

Mr. ALDERMAN HADLEY, President National
 Association of British and Irish Millers,
 City Flour Mills, London, England.

DEAR SIR:—The Millers' National Associa-
 tion of the United States, believing that the
 great interest now felt in improving milling
 could be advanced by more extended personal
 acquaintance, and comparison of views and
 results, have decided to hold a Millers' Expon-
 sition for say two weeks, commencing June 1st,
 1880. It will be held at the time of the next
 Annual Convention, at Cincinnati, when there
 will be abundance of room provided, and
 ample power for the display of milling
 machinery, and I can assure you that no pains
 will be spared by our American millers to
 make it a grand success. As it is to be inter-
 national in character, we shall heartily ap-
 preciate your cordial co-operation. Enclosed I
 send you a few slips, cut from our milling
 papers, and I have ordered some extra numbers
 mailed to your address. Please let us hear
 from you at your earliest convenience, with
 any suggestions that may occur to you. Will
 the Association of British and Irish Millers
 want to reserve any special department or
 space for their members?

Yours respectfully,

F. B. MILLS, Asst. Sec.

MILLERS' NATIONAL ASSOCIATION,
 Milwaukee, Wis., Nov. 7, 1879.

J. H. CHATTERTON, Esq., Secretary British
 and Irish Millers' Association, 69 Mark Lane,
 London, E. C.

DEAR SIR:—I take the pleasure in calling
 your attention to the Millers' Exposition, which
 the Millers' National Association of the United
 States purpose to hold at Cincinnati, in June,
 1880, and ask your cordial co-operation with
 us to make it both interesting and profitable
 to all who may honor us with their presence.
 For our object and intentions I will refer you
 to our milling journals, several copies of which
 I have ordered, mailed to your address. It is
 designed to make the Exposition decidedly
 international in character, and no pains will
 be spared to make it a grand success. I have
 just written Mr. Hadley, your honorable Presi-
 dent, asking that your Association take a
 prominent part, and would also ask that, as
 far as practicable, you will lay the matter
 before your millers, bakers, and manufacturers
 of milling machinery.

Yours respectfully,

F. B. MILLS, Asst. Sec.

The President: I may mention, gentlemen,
 that if it is at all possible for me to spare the
 time I intend leaving this country in May, so
 as to be in America in the first week in June.
 (Cheers.) If any gentleman is desirous of
 going, I should have great pleasure in travelling
 with any members of our milling fraternity in
 this country, if they feel disposed to go over
 at the same time. We will now proceed with
 the next business, and I have great pleasure
 in calling upon Mr. Carter to read his paper
 on "The Bad Harvest of 1879, and the Manu-
 facture of Flour from Foreign and Soft British
 and Irish Wheats by Modern Machinery."

Mr. Carter then read as follows:—

GENERAL REMARKS.

The first portion of the subject announced
 for my reading to-day I shall dismiss with a
 very few words. The pages of the milling
 journals, your own experience as millers, and
 some of you as farmers, must have proved to
 you most conclusively that the 1879 harvest of
 Great Britain and Ireland, for quantity, quality
 and condition, never was worse—probably in
 the 19th century has never been so bad. The
 introduction of foreign seed wheats to produce

earlier crops, such as I have seen in other
 years, ready for the sickle, on the farm of Mr.
 J. J. Mechi, whilst the surrounding wheat fields
 were green, would have been of no avail this
 year, for the best crops of corn I have seen
 have been in the backward northern districts.
 The manufacture of flour, partly from our na-
 tive wheats, and partly from the many varie-
 ties of foreign wheats, is a question for the
 British miller to solve which exceeds in diffi-
 culty that presented to the millers of any other
 nation in the world. What better time could
 there be for discussing it, than when an ex-
 ceptionally bad home harvest has presented
 those difficulties to you with unprecedented
 and unpleasant severity. The deficiency in
 home wheats is being made up by large import-
 ations from abroad, and I propose now to en-
 quire not only how can the miller who mills in
 districts where native wheats are plentiful
 adapt his machinery to working more foreign
 wheats, but how can he render the native
 wheats useable? I go farther, and in a direc-
 tion which will, I presume, be more interesting
 to the majority of those present who use large
 quantities of foreign wheat, and I intend to
 indicate the system which leading millers must
 adopt and adopt quickly, if they intend to com-
 pete successfully with foreign flour.

THE COMMON OBJECT OF OUR ENQUIRY.

Let us now consider what is the common ob-
 ject of our enquiry, not forgetting that we
 have to deal with wheats from all parts of the
 world. As I understand it, it is that we should
 divide the flour portions of the wheat berry
 as completely and distinctly as possible from
 the offal; in other words, that we should put
 the flour into one sack, the offal into another;
 as little as possible of the flour into the offal
 sack, and as little as possible of the offal into
 the flour sack. Flour is too valuable, and offal
 too cheap, to admit of much of the former be-
 ing sold adhering to the latter, and the demand
 for low quality bread is so limited that as small
 a proportion of your flour as possible should
 be deteriorated in quality by the presence of
 cerealine, or offal flour. One advantage of our
 great choice of wheat is, that for a specially
 good flour you can purchase a specially fine
 wheat, and if you wish to go farther and make
 an extra choice semolina flour, the system I
 shall recommend you will enable you to do so
 without trouble, and with no additional cost
 save lessening the value as it were of the mill
 from which you skim the cream. I would not
 occupy your time for one moment in consider-
 ing, as I am about to do, the complete roller
 mill system, were I not satisfied that it is the
 best for the production of a general run of
 flour.

DR. CHARLES GRAHAM.

Since writing this paper I have had the
 pleasure of an interview with Dr. Charles
 Graham, Professor of Chemical Technology of
 the University College, London, who is at
 present engaged giving the series of Cantor
 lectures at the Society of Arts, on bread baking.
 He very much regrets that his preparations
 for this evening's lecture and experiments pre-
 vent his being present at this meeting. He
 made to me this novel but welcome statement
 which he intends proving in his lectures, viz,
 that the offal portions of wheat are not the most
 valuable for producing power, i. e., enabling
 men to do most work. Practice (he says) proves
 that a labourer who has work to do demands
 white bread, and any addition made is in the
 form of fat. He also says that the presence
 of minute bran particles in the flour produce
 hydration fermentation, i. e., they make to
 much sugar and gum in a given time, and
 thereby produce colour products in the oven.
 We therefore start to-day, for the first time,
 so far as I know, with science on our side in
 favor of white flour.

GENERAL MILLING SYSTEM.

In addition to the old low grinding system
 there are four others:—1st. Gradual milling by
 rollers, &c. 2nd. Gradual milling by millstones,
 &c. 3rd. High and half-high grinding by a
 combination of millstones and rollers, &c. 4th.
 A combination of rollers and disintegrators.
 The last system has been ably placed before
 you by Mr. Sanderson in a paper which so
 many of us listened to with pleasure and satis-
 faction. The second—gradual milling by
 millstones, &c.—is without doubt by far the
 best application of millstones; but the cost of a
 complete roller-plant, with its accompanying
 purifiers and dressing-machines, is so reason-
 able, and requires only the fluted rollers for
 breaking down the wheat, as an addition to
 the plant you would have to adopt for succes-
 fully carrying out the gradual milling by mill-
 stone system, that I am confident most of you
 would adopt the No. 1, or the "gradual mill-
 ing by rollers," which I now advocate as the
 best. I have not come to this conclusion with-
 out repeated investigations on the continent,
 or an intimate knowledge of the old system,
 gained by many years' varied experience in
 milling; but more particularly have I come to
 this conclusion from the fact of experiencing
 great difficulty with a large new plant I have
 lately erected, in getting the whole of the
 flour as pure as was desired, though we have
 succeeded in surpassing all other samples we
 have compared with, from similar wheats,
 thanks, no doubt, to a considerable extent to
 the continued attention of a clever foreman.
 Improved process requires improved manage-
 ment. I would here diverge for a moment to
 caution millers who may now contemplate
 adopting a roller-plant from hesitating to do
 so from a knowledge of the fact that a consid-
 erable amount of high-class American flour
 is coming here manufactured by what is called
 the new-process system: remember we do
 not know what their produce is, nor do we
 know what is done with all their poor first run
 flour though we do know that much of it can
 (Continued on page 59.)

Friedmann's Ejector.

We give herewith an engraving which will afford an idea of some of the uses to which the ejector is applied. It is not only very simple, but one of the most effective machines within recognized limits, for raising water and conveying liquids rapidly and economically by steam, that has yet been invented, and in many instances the only one that can properly do the work.

It is applicable in a great variety of forms for raising water and other fluids from tanks, wells, ponds, mines, quarries, holds of vessels, docks, gas works, wheel pits, and it is also well adapted for conveying liquids, of various degrees of consistency, from tank to tank or floor to floor in breweries, chemical works, distilleries, sugar refineries, and other similar establishments.

In outward appearance the ejector is a cylinder of irregular form, varying in length from 6 inches to 3 feet, according to size and capacity, and in circumference proportionately to its length. There are three apertures in each machine, one for steam, one for suction, and one for discharge, that which admits

second cone, and that in turn becomes a motor to the next, and so on until the last is reached. The water or liquid, accelerated in its passage through these successive nozzles or cones, as well by the force already described as by the vacuum always formed under such conditions, is carried with great velocity through the diverging pipe into the discharge pipe, with all the force and rapidity necessary to convey it to its required destination.

As a means of ejecting water in sinking shafts and cross-cutting drifts these ejectors are valuable, as they can be adjusted to the work, as it progresses, by simply lengthening the piping, the slow process of keeping the water free by means of buckets or bailing out being thus dispensed with.

The lower right hand view in the engraving gives a general idea of the operation of the ejector in shallow mines or coal pits, where the depth is not more than 100 feet.

The upper right hand view shows the ejector placed on the bank of a lake, river, or pond, 10 to 15 feet above the level of the water, for raising water for irrigation and other purposes. The large central view shows the ejector as

that pumps are almost always in a state of disarrangement, whereas there is nothing in the ejector that can get out of order or be misplaced.

The upper right hand view shows the application of the ejector to the filling of railway tanks, and the view below it shows its application to work in breweries and chemical works.

The ejectors are made in different ways for different purposes, and persons contemplating adopting these useful instruments should address Messrs. Nathan & Dreyfus, 108 Liberty street, New York city, for further information.

Illinois Millers.

SIXTH ANNUAL MEETING OF THE ILLINOIS MILLERS' STATE ASSOCIATION.

MORNING SESSION.

The Sixth Annual Convention of the Illinois Millers' State Association was called to order at 10 o'clock A. M., Friday, December, 5, in the parlors of the Leland Hotel, Springfield; President D. R. Sparks, of Alton, in the chair.

At the request of Mr. C. H. Seybt, the Sec

bia; Francis J. Faltus, Carlinville; John C. Stoltz, Pekin; John Atwood, Alton; M. R. Thayer, Chattanooga; together with a large number of visitors.

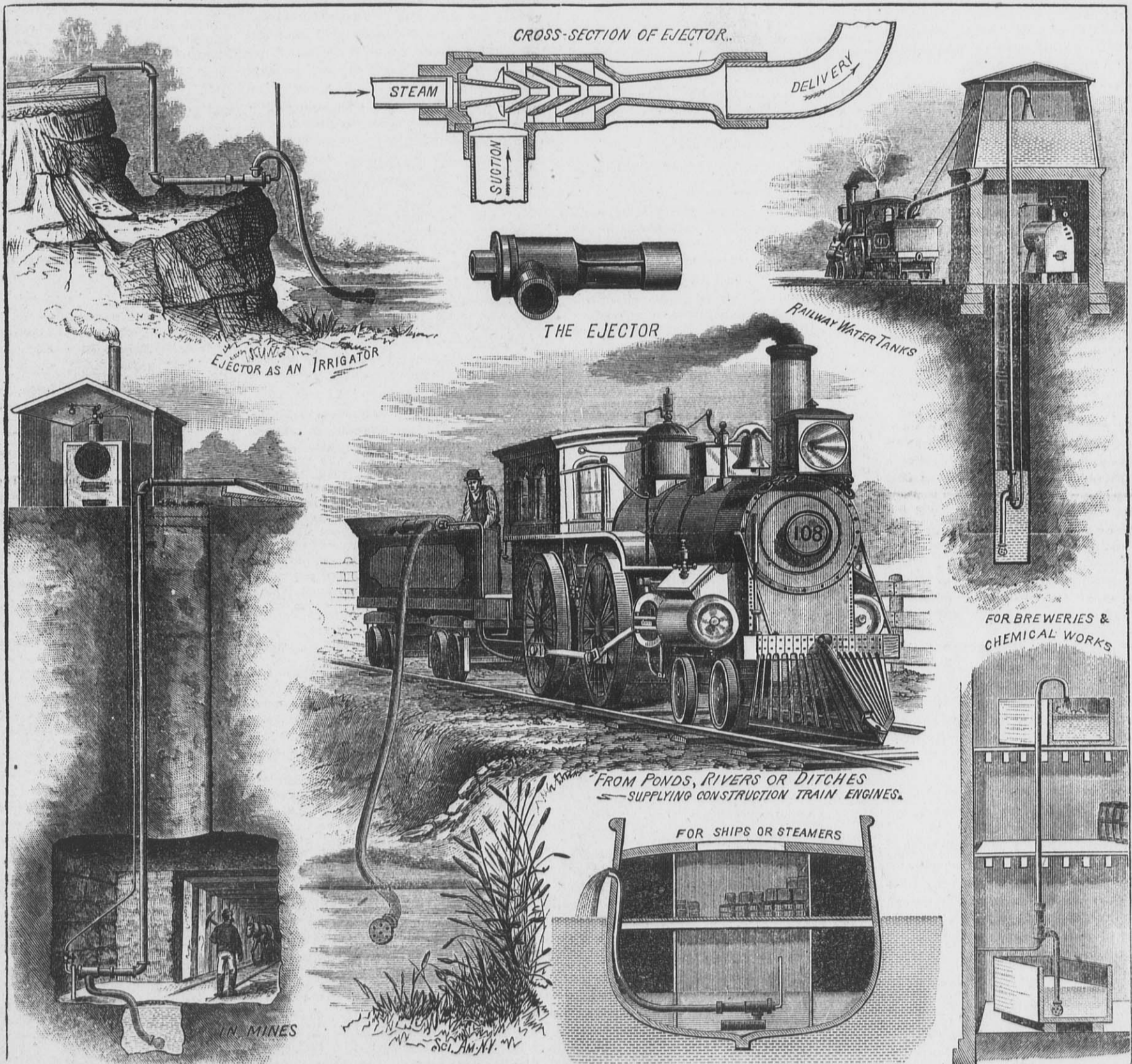
The minutes of the last annual meeting, December 4, 1878, were read and approved.

On motion, H. B. Whitmore, of Quincy, was elected a member.

Numerous letters were read from absent members, which were listened to with pleasure, and some of them elicited considerable applause for the wit and sentiment, as well as for the many valuable suggestions contained therein.

On motion, a committee of three was appointed to nominate officers for the ensuing year.

The Chair appointed as such committee Andrew Eisenmayer, C. B. Cole, and D. F. Shellabarger, and addressed the convention at some length, reviewing the work accomplished since he had occupied the chair, and the great good attained by the entire milling fraternity through the instrumentality of the Millers' Association. He had been its President for a number of years, and would greatly prefer not



FRIEDMANN'S EJECTOR.

steam being much smaller than either of the other two.

The sectional engraving at the top conveys a clear idea of the internal construction of these ejectors and reveals at once to the mechanical eye the secret of their power. It will be perceived that they are provided with a series of intermediate nozzles or cones, firmly fitted to the body of the ejector, by which the water from the suction pipe is admitted to the receiving chamber in successive streams.

The great utility of this arrangement (which is the vital principle of the ejector) lies just here. In the ejector the steam jet acts at first only on that portion of the incoming water which is admitted through the first nozzle or cone, so that only a comparatively small jet of steam is required to move it. The stream, propelled by the force of the steam, gives an impetus to the water entering through the

applied to the filling of locomotive tanks from a river, pond, or ditch; and the view immediately below it shows the application of the ejector as a bilge pump. In view of their complete adaptability to this kind of work, and their ability to keep ships clear of water in case of accident from shot or shell, or leakage of any kind, the French, Austrian, Russian, Italian, Belgian, and other navies have provided their men-of-war with them.

We are informed that the British navy have also adopted them after a thorough test, and after a severe competition with those of English make. Ocean and coasting steamers provided with one or more of these ejectors in each water-tight compartment would have a means of keeping clear of water until the necessary repairs could be made.

It is not sufficient to say that a steamer is provided with pumps, as it is a notable fact

retary, Col. W. L. Barnum, of Chicago, was appointed to assist him in his duties.

The roll call showed the following members present;

D. R. Sparks, Alton; Ad. Emig, Trenton; John Alt, Effingham; S. H. Bradley, Mendon; F. W. Brickey, Prairie du Rocher; G. C. Trull, Macomb; J. Q. Burbridge, Alton; C. B. Cole, Chester; C. H. Seybt, Highland; H. C. Allen, Grafton; J. B. Davis, Shelbyville; Andrew Eisenmayer, Trenton; W. L. Barnum, Chicago; D. S. Shellabarger, Decatur; C. Eisenmayer, Summerfield; W. H. Davis, Glasford; H. R. Whitmore, Quincy; Henry Schuerman, Germantown; S. C. Wilson, Olney; W. T. Crow, Cotton Hill; Wm. Broeker, Springfield; Wm. Grimsley, Springfield; H. G. Fahs, Olney; A. Stubbs, Delavan; B. H. Ironmonger, Mason City; E. C. Kreider, Jacksonville; A. Dow, Pittsfield; Thomas Konigsmark, Colum-

to be considered a candidate for another term.

On motion, the Chair appointed F. W. Brickey, J. B. Burbridge and Conrad Eisenmayer a Finance Committee to examine the accounts of the Secretary and Treasurer.

Both committees were instructed to report at the afternoon meeting.

The convention then, on motion, adjourned to 2 o'clock P. M., and the members enjoyed, in a very high degree, an hour of informal expression of views upon most subjects pertaining to the milling art. The present status of the Cochrane and Denchfield patent suits were also very freely discussed.

AFTERNOON SESSION.

The convention was called to order by the President promptly at two o'clock pursuant to adjournment. On motion, Francis J. Faltus, of Carlinville, was elected a member.

The reports of committees being called for, Mr. Brickey, Chairman of the Finance Committee, submitted the following:

The undersigned committee being appointed by D. R. Sparks, President of the Millers' Association, of Illinois, to examine the accounts of C. H. Seybt, Treasurer of the Millers' Association, of Illinois, find that the moneys received have all been accounted for, and that there is at this date left in the treasury the sum of \$613.25. Given under hands this day above written.

F. W. BRICKEY,
E. EISENMAYER,
J. Q. BURBRIDGE,

Which, on motion, was unanimously received and adopted.

C. H. Seybt, Secretary, being called, made a very able address, reviewing at length the work done during the past year by this Association; giving receipts and disbursements in detail, and showing a cash balance on hand. He also gave a complete synopsis of the work done and the results accomplished by the Millers' National Association and by the Executive Committee thereof. His address was listened to with marked attention, and elicited rounds of applause.

Messrs. Brickey and Eisenmayer deemed it advisable to settle at once the assessments levied by the National Association, whereupon the following resolution, offered by Mr. Cole, was unanimously adopted, to wit:

Resolved, That the Secretary be instructed to levy an assessment of \$10 per run of stone for payment of arrears in the National Association and for the payment of current expenses for the coming year.

By request of some of the members, Mr. Cole offered a resolution regarding the appeal of the Cochrane suit to the United States Supreme Court, which was amended by Mr. Burbridge, and again by Mr. Whitmore, some advising pushing the case to an early decision, others favoring letting the case take its usual course on the docket. And after some discussion was adopted as follows:

Resolved, That Mr. Seybt, our member of the Executive Committee of Millers' National Association, be instructed to let the Cochrane suit, appealed to the Supreme Court of the United States, take its regular course unless in the opinion of the Executive Committee an early decision is deemed advisable.

Resolved, Further, that if they deem it desirable to have the case advanced on the docket and a speedy decision obtained, then the Secretary of this association be instructed to levy an additional assessment of \$5 per run of stone to pay this State's proportion of the expenses of said suit.

The nominating committee then made the following report:

Your committee, appointed to make nominations for officers for the ensuing year, would respectfully report the names of the following gentlemen:

For President, D. R. Sparks; for Vice-Presidents, E. C. Kreider, J. B. Davis; for Secretary and Treasurer, C. H. Seybt.
D. S. SHELLBARGER,
N. EISENMAYER,
C. COLE.

Mr. Sparks, in accepting the presidency for another year, made some very happy hits. He wished that some other person had been selected, but as he had been the unanimous choice, he would do the best he could, and thanked the association for the numerous favors they had conferred upon him.

Mr. Seybt being called for, congratulated the association on their choice. He had been in hot water so long that he rather liked it. The Secretary of the association was in hot water most of the time, and as that pleased him, he thanked them for his election, and hoped they would elect him another year.

The adoption of a new Constitution in harmony with that of the National Association being next in order, the following was read by the Assistant Secretary, then read, amended and adopted by sections:

CONSTITUTION OF THE ILLINOIS MILLERS' STATE ASSOCIATION.

The undersigned, millers engaged in the manufacture of flour and meal in the state of Illinois, hereby associate themselves together as the "Illinois Millers State Association," for purposes of mutual benefit and protection in their said business. And they do agree to be severally bound by these articles of agreement:

1. The officers of the Association shall be a President, two Vice-Presidents, and a Secretary and Treasurer. The last two offices may be held by the same person. There shall be an Executive Committee, composed of four members in all, the President of the Association being *ex officio* a member of the committee. All these officers shall be elected at the annual meeting of the Association for the term of one year, and shall serve until their successors are duly elected.

2. The annual meeting of the Association shall be held on the first Wednesday in December at such place as shall be designated by the Executive Committee, and special meetings may be called at any time by the President or Executive Committee.

3. The members of this Association shall also be members of the Millers' National As-

sociation, and the secretary of this Association is hereby authorized to enroll the names of the undersigned as members of the said "National Association."

4. It shall be the duty of the Executive Committee of this Association to cause any claim for infringement of patents in milling processes or machinery, hereafter made, against any member in good standing of this Association, to be duly investigated, and if advised that such claim is invalid, they may in their discretion cause the same to be defended by this Association, and may employ such professional or other assistance as they may deem necessary. The Executive Committee is also authorized to arrange with the owners of meritorious and valid patented improvements for reasonable terms for the use of the same by members of this Association; *Provided*, That all the action by the Executive Committee of this Association in reference to patent claims shall be in harmony with and subject to the action of the Executive Committee of the Millers' National Association, and the assessment by the Millers' National Association upon its members, for any year, within the limits hereinafter agreed to be paid, shall be first collected by the Executive Committee of this Association from the members of this Association for the said National Association, before any assessment is made for the benefit of this Association alone for that year.

5. Each of the undersigned hereby agrees to pay on demand the amount of any assessment made by the Executive Committee of this Association, or of the Millers' National Association, for the promotion of mutual protection or for the common benefit in any manner deemed advisable by said Committees, or either of them, not exceeding in any one year, for all purposes, including both the State and National Associations the sum of \$15 for each run of burrs, or its equivalent in capacity of other machinery, as may be adjusted by the Executive Committee, which the undersigned may operate upon wheat, or its products; *Provided*, That no assessment shall be made by the Executive Committee of this (State) Association in any one year, for purposes of this Association, until the amount of assessment made for that year by the National Association have been paid.

6. The assessments so authorized may be made in amounts, and at times, within the limits hereinbefore fixed, to be determined by the Executive Committee of this Association and of the National Association in their discretion, and each Committee may apply funds so received to any lawful purpose of mutual protection or common benefit in its discretion, and the members of the Executive Committee of this (State) Association, as constituted at any time, are hereby empowered, as trustees of an express trust, to sue for and recover in their own names all assessments made upon the undersigned whether for this or the National Association.

7. The defense of any patent suit by this Association or the National Association, as above provided, shall be managed and directed by the Executive Committee of the association by whom the defense is made, and no settlement or compromise of such suit shall be made, except upon terms accepted by such committee for the benefit of all members of such Association who may use the devices or processes in controversy. Any member so sued and defended, who shall settle or compromise his case without the consent of the Executive Committee having the same in charge, shall refund to the Association, at whose expense the defense shall have been made, all sums expended in that defense by such Association.

8. Any member failing to pay assessments, made as herein authorized, within ten days after demand, may, on vote of the Executive Committee of this Association, be removed from the list of members of this Association.

9. This agreement shall continue ten years, and in case any of the undersigned shall leave the milling business within that time he shall be released from his obligations under this agreement, on paying all assessments of his Association and the National Association for the year then pending, provided that any member, on leaving the milling business, may, with the consent of the Executive Committee of this Association, cause his successor in the milling business to be substituted in his membership herein.

10. No member shall be hereafter admitted into this Association except as provided in the last preceding section, without paying in full the amount of all assessments heretofore paid by the then existing members, including the amount paid by the members of the Millers' State Association as heretofore organized; *Provided*, That all mills which have been running only since the 1st of January, 1879, may be admitted on application upon the payment of \$25 per run, and mills, which may hereafter be built shall only be admitted, provided they make application for such admission within three months after they shall have been put in operation, and no assessment shall be made against them for the current year of their admission to membership in the Association.

It was then, on motion, adopted as a whole, and declared to be the Constitution of the Illinois Millers' State Association on and after this date.

On motion, an Executive Committee of five were elected by ballot, which resulted in the following choice; D. R. Sparks, of Alton; B. B. Cole, of Chester; Underwood, of Dixon; E. C. Krieder, of Jacksonville; and F. W. Brickey, of Prairie du Rocher.

The Secretary of the Millers' Mutual Fire Insurance Association, of Illinois, made a favorable report of that Company, but it being

so near the time when the annual report in detail would be made to the State authorities, it was deemed not best to publish it at this time.

The meeting then, on motion, adjourned to 8 o'clock P. M.

EVENING SESSION.

The meeting was called to order by the President at 8 o'clock, and for an hour there was a regular love feast. Matters pertaining to the interest of the fraternity were freely discussed, in which nearly all participated, and all seemed to enjoy.

At 9 o'clock P. M., on motion, the Convention was adjourned, to meet in Springfield on the first Wednesday in December, 1880, at 10 o'clock A. M.

American Grain.

THE ENORMOUS AREA CULTIVATED, AND HOW ITS PRODUCT COMPARES WITH THE YIELD OF OUR GOLD AND SILVER MINES.

The most interesting article to Americans in *Macmillan's Magazine*, for November, is that of Mr. L. B. Sidway, of Chicago, on "The Grain-Producing Power of the United States." We copy some of the most striking passages:

The States of Ohio, Indiana, Michigan, Illinois, Wisconsin, Iowa and Missouri contain 250,000,000 acres of land.

After making the liberal deduction of 70,000,000 for lands which, for any reason, could not be cultivated profitably at this time, there would remain 180,000,000 million acres, of which 90,000,000 are in cultivation, leaving 90,000,000 which may be cultivated with a profit.

Minnesota, Nebraska and Kansas contain 160,000,000, including probably 40,000,000 acres of the plains of western Nebraska and Kansas, upon which the summer rainfall is not sufficient for growing grain; the chief value of this land is for grazing only.

Of the remaining 120,000,000 probably 90,000,000 acres are adapted to profitable cultivation at present. Something over 12,000,000 acres of these lands are now cultivated, leaving 78,000,000 acres of uncultivated land of good quality ready for immediate use. There are in the Territories of Dakota, Montana and Wyoming (chiefly in Dakota) large tracts of fertile prairie, very productive in wheat and other small grain; but the lack of transportation facilities, the long and rather severe winter, and inability to procure the extra help needed for harvesting the crops, together with an abundant supply of cheap fertile land nearer to the markets, have prevented any large settlements from being made.

Now, however, railways are being constructed, and the perfection recently of the self-binding reaper, with which three men can harvest the same amount of grain which seven men could with the reapers formerly in use, obviate this very serious drawback, and considerable settlements are now being made.

The area of really fertile land in these three Territories is at present difficult to determine, nor will it be settled as fast as the country south and east—fast enough, however, to within a few years add materially to the wheat production.

The State of Texas contains 180,000,000 acres, the largest part of which is now used for grazing. Much of it will be used for growing cotton and other Southern productions. It is safe, however, to estimate that Texas will furnish 60,000,000 acres of good grain, besides the cotton and grazing, land.

The Indian Territory, adjoining the north line of Texas, contains about 50,000,000 acres, most of which is good and much of it very superior land. This Territory is now the home of peaceable Indians; but it is only a question of time when they will have to give place largely to the whites. Probably 30,000,000 acres would be a very moderate estimate of the grain land it contains, leaving 20,000,000 acres for grazing.

If these estimates are correct, and I think they are rather under than over the mark, the Northern Territories and State of Texas will furnish for grain growing fully 150,000,000 acres.

Crossing to the Pacific coast, we find in California a large aggregate of very fertile wheat land, but it is not in great bodies, as on this side of the mountains, and the number of acres yet available is, for several reasons, difficult to determine.

The fertility of the California soil and yield of grain, fruit and root crops is as marvelous as the size of its forest trees.

In Oregon production has, until within the past two or three years, been confined chiefly to the Willamette valley; now, however, an

extensive tract of prairie country in Eastern Oregon and Washington, known as the Walla-Walla region, and until recently used only for grazing, is found to produce very large crops of excellent wheat, and is being rapidly settled.

That the supply of wheat from the Pacific coast will steadily if not rapidly increase, hardly admits of reasonable doubt.

Returning east of the Rocky Mountains, we find in the first-named ten States 102,000,000 acres in cultivation, and 138,000,000 yet to be added.

In Texas and the Indian Territory, 90,000,000 acres of grain land, of which probably less than 5,000,000 is now cultivated; and in Dakota, Wyoming and Montana probably at least 60,000,000 fertile acres, of which not enough is now in use to be worth counting, giving a total of 283,000,000 acres of fertile land to be added to the 107,000,000 acres now in cultivation in the great grain and provision producing centre, not including California and Oregon, and no account being made of the fertile valleys of New Mexico, Colorado, Idaho, Utah, Wyoming and Montana, which in aggregate comprise a very large area.

No account has been made of that portion of Canada known as the Manitoba or Red River country, which is said to contain large tracts of excellent wheat land, because it is all located north of 49 degrees north latitude, still north of the north lines of Minnesota and Dakota, where the winters are very long and extremely cold, the thermometer hardly ever failing to mark in the neighborhood of 40 degrees below zero, Fahrenheit, for many days of each winter; and although it is a good wheat and oat country, there is practically no other crop produced for export, hence the farmer has profitable employment for a little more than half of the year; the long and severe winters render stock-growing for market impracticable, and there is apparently nothing to create more than one considerable industry, railways will have business but a few months of each season, which will render high freight charges a necessity. Altogether, the disadvantages are so many that, while the settlements may be considerable, it is not probable that the increased production will be of great importance in the commerce of the world, so long as, at least, quite as good land is to be had at a nominal cost in a more southerly latitude.

In this connection it may be well to refer to a fact which is very important in considering the question of increased production of grain and provisions in America, and which has apparently not received general attention.

The fertile grain lands of Texas and the Territories, although good, and in many localities excellent, cannot as a whole be ranked as equal to that of the first ten States, where the average soil is not only more fertile but the productions are more varied and less liable to be affected by insects or extreme atmospheric conditions. For a considerable time at least this 380,000,000 acres will undoubtedly furnish much the largest part of the grain and provision surplus, except probably beef cattle.

The grazing country which is attracting so much attention extends from the Texas coast on the Gulf of Mexico north almost to the Canada line, and westward from near the ninety-eighth parallel to the Pacific Ocean, including many millions of acres in Texas, Kansas, Nebraska, Dakota, Montana, Colorado, New Mexico, Utah, Wyoming, Idaho, Washington, Oregon and California. It would be impossible to estimate correctly the acreage of grazing country, nor is it necessary in this connection, for there is so much of it that the number of cattle and sheep now being grazed is very small compared with what may be. The grasses and sedge have the quality of curing as they stand, which (as there are no summer rains) furnishes an adequate supply of winter food.

It is often stated that the Western farms are becoming exhausted by constant cropping without using manures; such impressions evidently arise from the application of a general principle, and are not sustained by the facts. The surface soil of these prairies is composed largely of vegetable loam strongly impregnated with lime; it readily absorbs ammonia and other fertilizing properties from the atmosphere, and is so deep that fresh fertile soil may be thrown to the surface from any depth to which it is possible to plow. There are no stones in the ground, hence deep plowing is comparatively easy and costs the farmer very little. By a profitable rotation of crops, an occasional deep plowing, and at most a cropping with clover once in eight or ten years, the original fertility is not only maintained but

(Continued on page 42.)

GRAIN.

Peculiarities in its Normal and Manufactured State.

An Investigation Under the Microscope—Showing the Adulterations and Natural Evils to which It has been Subjected.

A COMPLETE INVESTIGATION OF THE SUBJECT BY ONE OF THE LEADING CHEMISTS OF EUROPE.

Flour in General—Wheat Flour—Rye Flour—Barley Meal—Oat Meal—Indian Corn—Rice Meal.

[Translated from the German of Dr. Herman Klencke expressly for the UNITED STATES MILLER,—cuts reproduced by our special engraver from the original.]

[Continued from December number.]

RYE FLOUR.

It is the ground corn of *secale cereale*, which likewise contains gluten, but in no smaller quantity than wheat-flour. A chemical analysis gives the following results: Starch, 61.09; gluten, when moist, 9.48; albumen, 3.27; glucose, 3.27; gum, 11.09; fibrous substance, 6.38; fatty matter, etc., earth and magnesia containing phosphorus, 5.42. Rye flour does not look as white as wheat-flour. The gluten which has been separated in the well-known way has a specific odor, like that of bread. It is yellow, elastic and may be easily kneaded. When dry it is brown, horny, has a glassy fracture, can not easily be reduced to powder, is insoluble in cold water, but little soluble in boiling water. In boiling alcohol, however, it will dissolve entirely. The effects of acid and alkali are the same as on the gluten of wheat. Moreover, if rye-flour is burnt in a crucible, it will yield one per cent of ashes, which consist of pallium, natrium, lime, magnesia, oxyd of iron, phosphoric acid, sulphuric acid and silicic acid, more or less in quantity according to the soil. For our purposes, the examination as to the pureness or adulteration of the flour, the starch particles are of great importance, since, when under the controlling microscope, they show a certain characteristic shape. Fig. 23 represents them, their diameter magnified 420 times. In shape and size they do indeed resemble those of wheat-flour, but at the same time they have very decided and conspicuous distinguishing characteristics; the smaller particles, for instance, are of much smaller size than the smaller particles of wheat; the larger, on the other hand, mostly have less concentric rings, and, as a particularly striking characteristic, the fissure must be regarded, formed by the cracked husks and representing, as it were, linear, or cross and star-shaped figures. To discover whether rye-flour has been well ground and does not contain many husky particles, the microscope must be applied, and the characteristic forms of the fragments of the husks searched for. Fig. 24, A, B represents them as they appear in the longitudinal and cross section of the kernel of rye. Particularly by the ergot of rye, rye-flour is frequently injured, the safest and easiest way of detecting which is by means of the microscope. (Compare fig. 112.) The outer appearance alone when showing violet dots can give rise to suspicion as to the presence of it in the flour. The intentional adulterations with poorer admixtures occur as frequently, if not more so, in rye as in wheat-flour. The means of discovery are the same as have been minutely described under the head of the latter. The same applies to the adulterations with potato-starch, cow, or black wheat, flour of legument and minerals. The rye-flour imported from Belgium is very frequently adulterated with linseed flour; in the years 1846 and 1847, for instance, all rye-flour shipped from there had been thus adulterated. To detect this, a small quantity of flour is put into cold water, about four times the same quantity in weight of water as the flour which is to be dissolved; for two hours it is allowed to soak therein, then the liquid is poured off and a few drops of a concentrated solution acetate of lead added, whereupon, if there is linseed flour present, a considerable precipitate of gum or mucous substance will be originated. It must be remarked, however, that pure rye-flour also contains gum or a mucous substance which will precipitate when the same process is applied. Consequently, so as to get a comparative standard by which to judge a precipitate must be formed of pure rye-flour at the same time, and it must then be observed whether this is much greater in quantity in the suspected flour. A more reliable method is that recommended by Donny, by means of which an admixture of linseed flour is clearly discernible, even if but 1 per cent of it should be

present. A little flour is dissolved in a few drops of a solution of corrosive kali (of 14 per cent, that is, 14 per cent of corrosive kali in 86 per cent of water), this mixture is put under a microscope, on a small plate of glass, and if the flour has been adulterated with linseed, small, unusually square pieces of a red color will be seen in the mass, which are almost all of the same size, but much smaller than the starch particles of rye. There is still another method that may be applied. Mareska recommended to let the suspected flour soak in ether of 59° for 2 or 3 hours, then to pour off the liquid, filtrate it, and let it evaporate. The residue is sprinkled with a solution of nitric quicksilver (mercury dissolved in plenty of strong nitric acid) which still contains dissolved nitric acid. Under the influence of this strong acid the oil in the rye-flour is changed to a solid mass of a fine red color; the nitric quicksilver is now again washed out with water, or the mass is put into boiling alcohol of 36°; this liquid is poured off, the residuum again evaporates, and if there has been linseed present, linseed oil alone will remain as residuum.

BARLEY-MEAL.

It is the ground seed-corn of *hordeum vulgare*; husked barley is called barley groats; if the kernels are rounded it is called peeled barley, the best quality of which is pearl-barley. The flour is yellow, scentless, and has no disagreeable taste; when softened in water it will acidulate it, so that blue lacmus paper will be dyed red thereby. Barley-meal consists of 60 parts of starch, 5 of sugar, 3.5 of dry gluten, 1 of albumen, 19.3 of husks and 11.2 of water. Moreover, it also has resinous components which are soluble in alcohol. What is called gluten in barley, is not exactly synonymous with the gluten of the other kinds of grain before mentioned, for it does not possess the same physical qualities, but appears rather like bran in flat pieces and of a white color. It can therefore not well be kneaded, and the water used for washing it out absorbs it almost entirely. But this then contains an insoluble caseous substance which will dissolve in a solution of ammonia and will be again precipitated by acetic acid. Pure barley-meal will yield 2.38 per cent of ashes, which consist of kali, natron, lime, magnesia, oxyd of iron, phosphoric acid, sulphuric acid and a good deal of silicic acid in greatly variable quantities. The starch-particles which, it is true, greatly resemble the particles of wheat, but which, nevertheless, have their characteristics, as represented in Fig. 25, are of great importance for the examination. When sufficiently magnified by the microscope, they are shown to be partly broad, partly narrow and of middle size in proportion to other kinds of grain; above all they appear about 3 to 4 times smaller than the starch-particles of wheat; the larger specimens have a distinct delineation of concentric rings, others a longitudinal furrow. The safest way is to compare the representations of them by the engravings, here given, during examinations with the microscope. In fig. 26 the enveloping husks of the barley-corn are represented

in its cross-incision as well as in its longitudinal incision. Barley-meal is distinguishable from wheat-flour by the manner in which boiling water acts upon it, for when boiling for a longer space of time an insoluble substance will be separated which has been called "hor-dien," while wheat-flour, when treated similarly, will dissolve entirely. Adulterations with other kinds of flour are disclosed by the microscope and the series of examinations given under the head of wheat-flour. It is probably most frequently adulterated with minerals, particularly carbonate of lime has been found therein; such flour compared with pure flour, filling the same measure, is much heavier and effervesces lively when acids are added; when incinerated it yields a great amount of ashes, which will, after the escape of the carbonic acid, contain lime instead of the carbonate of lime; which lime dyes red lacmus paper blue.



Fig. 23.—Starchy particles of rye-flour. Mag. 420 diameters.

[To be continued.]

CLEANSING MILLSTONES.—Yarns' process of cleansing millstones consists in the application of a commercial article known to the trade as "hydrofluoric acid," sometimes called "fluoric acid," to the grinding surface of millstones, for the purpose of cleansing them of glaze, and at the same time opening the pores or granulations. The stones are first placed in horizontal position, face upward, and after being dusted, or washed if necessary, hydrofluoric acid is used as a coating for the entire face. After the acid has remained upon the stone a sufficient length of time to remove the glaze, it is washed off with water, and the stone is ready for use. The acid is applied to the stone at different points, and spread with a brush over the entire surface. It is then allowed to remain from thirty to fifty minutes, according to the kind and condition of the stone. The glaze, it will be found, is not only removed, but the granulations of the stone will appear in perfect condition for work, and that without the use of a pick or other instrument. Ammonia with fluoric acid or ammonium-fluoride or other combinations with fluoric acid as an element, may be used.

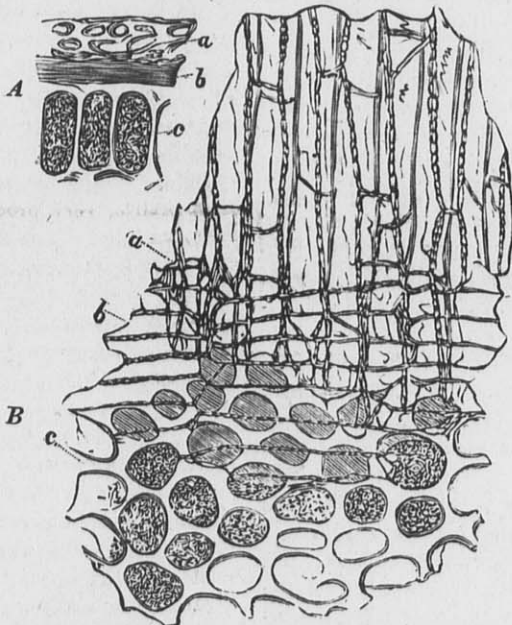


Fig. 24.—Structure of the outer membranes of a grain of rye. A, crop incision. B, longitudinal incision. aa, outer; bb, middle; cc, inner layers or membranes. Magnified 200 diameters.

FOR 300 years the silver coins of Rome preserved their weight and legal valuation with respect to gold as fixed after the close of the wars with Carthage. From 1795 to the end of 1877 there had been coined in France the following enormous sums: Gold, 8,435,426,700 francs—\$1,687,085,000; silver legal tender, 5,287,965,139 francs—\$1,057,573,000. Total, \$2,744,658,000. During the same period Great Britain, including the two Australian mints and the United States, coined as follows: Great Britain, since January, 1793, \$1,438,212,973; United States, January, 1793, to 30th June, 1877, \$1,203,823,892. Total, 2,642,046,865. So France has coined more money by \$92,622,935, under a metallic money system, than Great Britain and the United States together, including nearly \$1,700,000,000 in gold, when virtually producing neither gold nor silver.

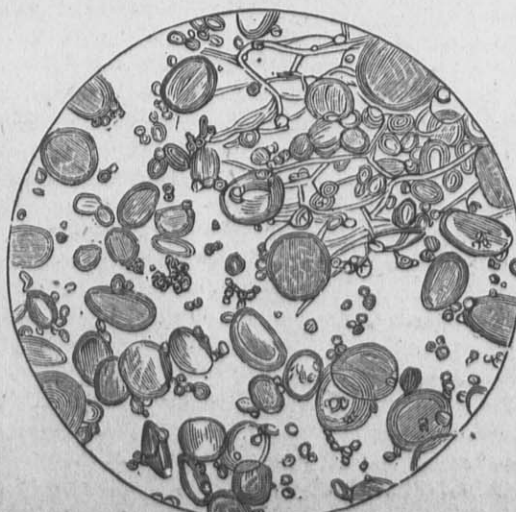


Fig. 25.—Starchy particles of barley-flour or meal. Magnified 420 diameters.

A Country Woodchuck.

HIS EXPERIENCE AMONG THE BULLS AND BEARS.

If you will step into the Board of Trade rooms in Detroit you will see him. But let us go back and see him before he gets there. He has watched the wheat boom from the first, and said to himself a thousand times: "Now, if I had bought some of that wheat when it was down to such a figure and sold it at such a figure, I'd have been money ahead." His arithmetic is good. His statement is undeniable.

A period of twenty-four hours has elapsed. Who is that brown-fisted man sitting alone in yonder car seat with a more than satisfied look on his face, and both legs sprawled out on the next seat ahead? Verily, he be a "woodchuck." He arose at daybreak, told his wife in a low tone of voice his intentions, left word to have the boys see to things until he got back, and, like the Arab, silently folded an extra shirt into his satchel and stole away to the depot just forty minutes ahead of train time. There he is, mentally kicking an intellectual arithmetic all to pieces in his impromptu efforts to figure up the profits he is going to realize from his encounter with the Board of Trade. There is just room enough in those two seats he and his feet occupy for him. Why is it that a man takes up so much more room when he is rolling up wealth than when he is doing just ordinarily well, is a puzzle. We only know that it is so, and perhaps that's enough.

The train moves on, and every minute is the next, as the poet has said. To a man that is going to make \$1,000 a day, time is precious; and strive hard though he may to check his impatience, he cannot help asking the conductor from ten to fourteen times if the train isn't late.

We pass over a period of two days. The woodchuck is shaking hands with the bulls and bears, and is already quite well acquainted. He speaks of deals, spreads, straddles and scalps with that off-handedness that marks the experienced speculator. He takes a deal—buys a 5,000 option, and settles back to see'er go up. He remarks to a pale-faced brother-in-options that foreigners are up and firm, New York strong, and Chicago "booming." The pale-faced brother, who has been going "short," doesn't deny it; he simply says, "let'er go to thunder," draws a fresh chew from his rubber pouch and passes on to the further window to see a tug tow a barge up the river. When you see a woodchuck de that you can bet he's got something on his mind—especially if his countenance indicates that there is nothing very blamed cheerful in our scenery. But to return to our woodchuck—before he gets into his hole. He could take a \$50 profit on his deal; will he do it? Naw—dang it; there's a clean \$500 scalp in it, bet your life. He didn't come here to play pins. And then he hunts up a "short" woodchuck, somewhere, and consoles him. Tells him wheat will be worth \$2 a bushel before June; that foreign markets have got to buy our wheat, and that they are in no shape to dictate prices either. "Gosh, just a-booming, ain't it?" he adds, as Chicago comes in a quarter higher; "wish I'd made it 20,000 instead of 5,000." And then he takes another deal, after assuring himself that it must go higher. This is the easiest thing in the world to do. To prove that it is, a member of the Board offered to bet \$50 the other day that January wheat would go up 5 cents before it did 6, and there wasn't a man in the room that took the bet.

Now do our readers think for a moment that we are going to follow this woodchuck every step until he gets home? Scarcely, for Detroit is a big town, and the city authorities, we understand, have not as yet abolished all the variety shows. We pass along and catch him just as he steps up to pay his hotel bill. Before he left the Board of Trade rooms that day he had been looking out of that further window himself—to see a tug tow a barge up the river. He went into a barber-shop that day, and the artist required him to put up a 15-cent margin before he'd lift a razor. Poor barber; the margin was soon exhausted, and he had to pocket the loss himself.

The bears had crowded the bulls that day and the woodchuck got squeezed. He simultaneously dropped his bundle and chin, settled his hotel bill, and started for the depot. He didn't occupy two middle seats in the car this time. There was more room than he wanted in the little half seat way back by the water tank.—*Lowell Journal*.

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Roller Mills.

EXPLANATION OF THEIR MANNER OF WORKING
AND COMPARISON BETWEEN THEM AND
MILLSTONES.[Translated by special permission from Professor Kick's
Die Mehlfabrikation].

[Continued from December number.]

The following roller mill materials have been tested by us as to their co-efficient of friction with fine middlings (too coarse to pass through No. 7 silk) and with No. 2 semolina:

No.	ROLLER MATERIAL.	FRICTION ANGLE AND CO-EFFICIENT OF FRICTION WITH THE FOLLOWING CLASSES OF FEED.			
		Purified No. 2 SEMOLINA.		WHEATBREAKS. (Too coarse to pass through No. 14 wire)	
		Friction Angle.	Co-Efficient of Friction.	Friction Angle.	Co-Efficient of Friction.
1	Chilled iron, polished bright.	12 deg. (17-24)	0.23	11 deg. (18-22)	0.184
2	" " fine dull.	16 deg. (31-36)	0.287	15 deg. (24-29)	0.288
3	" " Rolls that have been in use.	18 deg. (35-38)	0.335	17 deg. (27-33)	0.306
4	Porcelain (Biscuit, i. e., un- glazed), natural dullness.	22 deg. (3-44)	0.404	20 deg. (27-30)	0.384
5	Granite, polished dull.	23 deg. (38-42)	0.424	21 deg. (29-35)	0.384
6	Syenite, polished dull.	24 deg. (38-44)	0.445	22 deg. (32-35)	0.404

For No. 1 and No. 2 experiments the same plates of chilled iron were used, which, being six inches long by four inches wide, were polished bright for No. 1 experiment and then made dull for No. 2. On to these plates the fine middlings, semolina, and wheatbreaks were strewn successively, then the plates were raised by means of a lever arrangement, steadily and very slowly, until the middlings, etc., began to slide, followed by the gliding off from the plate of the greater part of them. By these means the figures given in the brackets were obtained. But as in this case a portion of the particles remained on the plate, even if the same were placed at greater angles than those stated, and, as in the case of fine middlings, the plate could be reversed without every particle falling off, the adhesion consequently interfering with this mode of ascertainment, a second method was adopted. On the plate on which the semolina, etc., had been strewn, a second plate of exactly the same material and description was placed, and a 12-8 lb. weight on the top of the same. The plates were then inclined by the above mentioned arrangement until the top plate began to glide; this gave the principal figures for the friction angle, and from this the co-efficient of friction for each material was deduced by the usual calculation. In order to make the experiments with porcelain and chilled iron under as equal conditions as possible, the plates used were not only of almost equal size, but as the top—porcelain—plate was lighter than the one of chilled iron, different weights were fastened to each, so as to make the pressure on a unit of surface the same for both materials. If this had been omitted the figures in the above table for No. 4 experiment would be, instead of 22 degrees, only 15 degrees, and instead of 20 degrees only 13 degrees, because with middlings and semolina, which is pressed into the pores, the co-efficient of friction increases with the pressure, and the friction angle with the porcelain plate unweighted was repeatedly found to be only 15 degrees and 13 degrees respectively.

The figures quoted above for No. 3 experiment, viz., 18 degrees and 17 degrees, are estimated from the gliding angles, and taken, if anything, too low, because the same manner of ascertaining could not be used, and the means at disposal in the technological cabinet were not able to produce so great a degree of dullness on our plates of polished chilled iron as the roller showed which had been in use.

The granite and syenite which were also tested came from the "Fichtel" Mountains; they were in cubes accurately polished (dull) with the sides two inches long.

From the above table it would appear that the co-efficient of friction of chilled iron polished bright, compared with that of porce-

lain, is as 1:2, while chilled iron which has become dull has only 20 per cent smaller co-efficient of friction. If in the latter case with porcelain the pressure of 100 had to be applied, it would have to be 124 for chilled iron, and as one-third of the motive power may be calculated for overcoming the friction in the roll bearings, only 8 per cent more power would be required by chilled iron rolls than by porcelain, which, considering the advantages of chilled iron, would be of no consequence. The adversaries of chilled iron would, however, not have to adopt porcelain, but granite or syenite, which would have at least an equally favorable surface and excellent durability. It is also apparent that the use of chilled iron rolls with a dull polish would be preferable to those polished bright, but most buyers wish to see their rolls shiny.

For grinding bran grooved rolls may be used. In this case there is no question of a shearing of the parts, but only of bending and rubbing them in such a manner that as many flour and middlings particles as possible are removed. For this work the rolls fluted according to the old system (fig. 110) with fine sharp grooves, would be best adapted. The product thus made should, from the rolls, go on to a detacheur or a centrifugal silk dressing machine, in order that the particles of middlings may be better loosened.

By this means comparatively good middlings may still be made. The final grinding of the bran is left to the millstones.

The roller material is not altogether without influence on the product. The finer and sharper the pores of the material, the whiter will be the color of the flour. Thus porcelain rolls give a somewhat whiter flour than chilled iron rolls. This higher degree of whiteness is, however, not the consequence of a smaller admixture of bran particles, but of a greater degree of fineness. There cannot seriously be any question of the steel or chilled iron rolls giving off any coloring matter whereby the color of the flour is influenced. Bakers prefer a pure yellowish flour to that which is excessively white; this is a point which is not favorable to porcelain rolls. The question of durability and the price must be a consideration of the greatest importance when deciding on the choice of roller material. Porcelain rolls are somewhat cheaper, chilled iron rolls very much more durable. Steel rollers get easier out of true, and also break more easily, than chilled iron; porcelain rolls do this in a still higher degree, and they are, moreover, subjected to no inconsiderable amount of wear. The following is part of a communication from Engineer Blumenthal, in Nuremberg:—"A Bavarian mill, which was fitted up in 1877, contains, besides chilled iron roller mills, also porcelain rollers with differential speed. While the former show no trace of wear, the porcelain rolls have got smaller by two to three millimeters (1-12 to 1-8 inch). This was found out, not through measuring and comparing with the original diameter, but through the rollers having got shifted somewhat lengthways, one end of each of the two rolls showing a rim of 1-12th of an inch, the rollers having been at work not quite half a year.

In this case a faulty mode of working the machine may have caused an excessive wear, still it proves that this material wears more than is good for every day work." Porcelain rolls also require turning up frequently in order to keep them in true cylindrical shape—a disagreeable work for the miller, which, with chilled iron and steel rollers, he can dispense with for several years.

At the Paris Exhibition we noticed that Wegmann's porcelain rolls were of such excellent quality that little pieces of quartz did not in any way injure the rolls; the stones were, however, crushed by them, notwithstanding the elastic spring pressure.

For grooved rollers, stone, porcelain and glass rollers are decidedly inferior, although the cutting of the grooves by means of the diamond dressing machine does not cause any particular difficulties, but the form of the grooves adapted to these materials cannot be as favorable as fig. 109 (see December number) shows for chilled iron. As a material for smooth rolls granite may be of equal value as chilled iron, but to our knowledge this material is not yet in use in flour mills. (Granite rolls have been successfully used in the manufacture of chocolate for some time past.)

The pressure of the rollers towards each other can be given either by set screws, weights, or springs. With the old "Sulzenberger" rollers one of the rolls revolved in fixed bearings, the second one was brought to a certain distance from it by set screws. The pressure on the roller spindles was caused, partly by the

weight of the roll, and partly by the resistance which the feed offered to the crushing. The latter was naturally varying, according to the quantity and quality of the middlings, etc., being crushed.

Trade-Marks.

(Special to St. Louis Globe-Democrat.)

WASHINGTON, D. C., Dec. 6.—The announcement of the decision of the Supreme Court of the United States respecting trade-marks having reached the attention of foreign governments, and the customs officers of this country having refused to recognize the force of the statutes on this subject, thus rendered nugatory by judicial action, these governments have called the attention of their ministers here to this subject, and have directed them to inquire what interpretation the Executive of the United States has to communicate with reference to the conflict between the statutes and the treaties.

Sir Edward Thornton, Mr. Shiskin, the Russian minister, and the representatives of the other governments interested, have called upon the Secretary of State in accordance with their instructions.

The Secretary has found himself much embarrassed in responding to their inquiries, as the action of the Supreme Court has placed the Executive in a very awkward position. The question which these foreign governments desire to understand is whether the treaties and solemn compacts between this government and theirs is to be subject to the decision of any judicial tribunal. The Secretary has the matter in examination, and has informed them that he will give it early attention, and he proposes to suggest to Congress that some modification of the law invalidated by the decision of the Court should be had, which will meet the necessities of these international obligations, if not the interests of our own people, in the inter-state relations.

The Secretary, in conversation on the subject, says that the effect of this decision has been to give foreign manufacturers an advantage over our own citizens, provided the foreign government insists upon the carrying out of treaty obligations. Eminent authorities in international law claim that a treaty is a part of the organic law of the land, and can not be abrogated by the decision of the Court.

The Secretary of State is of the opinion that this view of the question is a proper one, and that some action should be taken in the matter.

The official statement of agreements in relation to trade-marks between the United States and other countries shows treaties with the following nations:

Great Britain, by declaration of October 24, 1877, without limitation of duration, and extends to the entire British dominions.

Germany, December 11, 1871. Convention respecting consuls and trade-marks for ten years, from April 29, 1879, and provides that American citizens in Germany and German subjects in the United States shall have the same protection as natives.

Russia, by treaty of January 27, 1868, and March 28, 1874, without limitation as to duration, but can be abrogated on twelve months' notice.

Belgium, December 20, 1868; same provisions as Russia.

Brazil, September 24, 1878; without limitation.

Austro-Hungary, convention for ten years from November 25, 1871.

The trade-mark convention with France of April 16, 1869, has expired, being limited to ten years.

EDGE-LAID BELTS.—According to Leigh, a better method of producing a broad belt than the usual American double leather belting sewed together—a method by which the article can be made with the greatest ease, of any thickness or width, perfectly equal in texture throughout, and alike on both sides—consists in cutting up the hides into strips the width of the intended thickness of the belt, and setting them on edge, these strips to have holes punched in them about $\frac{1}{2}$ of an inch in diameter and 1 inch apart; nails, made of round wire, clinched up at one end for a head and flattened at the other, are used for fastening the leather strips together. Each nail is in this case half the width of the intended belt, and after the strips are all built upon the nails, the ends of the latter are turned down and driven into the leather, thus making a firm strap, without any kind of cement, splittings, or similar treatment. When a strap made in accordance with this plan requires to be tightened, it is only necessary to take it asunder at the step lines of the splice, cut off from each end of the strap what is required, and piece up again with wire nails or laces, going entirely through the strap.

(Continued from page 40.)

increased. The crops of these States for 1877, 1878 and 1879 are the largest of any three consecutive years ever known, not only on the newly but on the oldest cultivated land. When the land becomes so valuable that it is profitable to use fertilizers the yield will be greater; but before that time the average production will be largely increased through other agencies. Farming is not so well done in the United States as in Europe so far as relates to the amount of labor expended and care bestowed in making all the ground produce to its utmost capacity, and in saving and turning to account every available product; but it has been my experience that Scotch, English and German farmers coming to the United States soon learn that the better class of native farmers understand the country best. * * *

There has been some profit from our gold and silver mines, but the entire annual product has a value less than half as great as the annual agricultural products of Illinois alone, and well-informed persons estimate that the annual net gain in Illinois from agriculture is within 20 per cent of as much as the entire gross production of gold and silver in the United States. But since the panic of 1873 farming has gone on as usual, production has steadily increased, and economy, retrenchment and reduction of cost of production has been the rule. Soon after January, 1878, business began to show signs of improvement throughout the country, and during that year we imported to the amount of \$437,051,532 and exported to the amount of \$694,865,766, of which \$14,156,478 was foreign merchandise, \$46,574,914 was mineral oil, \$72,124,294 was manufactured articles and lumber, and \$562,000,000 was agricultural products. By January, 1879, there was a universal feeling that the worst had past and that another large crop would cause the farmers, who for several years had been practicing great economy and husbanding their resources, to begin making liberal purchases, revive business and establish confidence. The large crops came, and anticipated results are seen in every direction. The farmers had been doing well, but were timid and cautious, and disposed to hold back until perfectly safe and independent, and the confidence now visible in every department of trade arises from a knowledge that the increase of business is to supply demands which are being paid for by accumulated profits, and although the sudden demand for merchandise and the increased carrying trade will lead to a spurt of speculation, from which a reaction is inevitable, the basis for renewed prosperity is in the main substantial. These profits have not been accumulated by the wage class, manufacturer, merchant, or owner of city real estate, nor, except in a small way, by the miner. While other things have contributed to the revival of business and the return of more prosperous times, unquestionably the greatest contribution has been from the profits of farming.

THE convention of agriculturalists at the Metropolitan Hotel, for the purpose of organizing a national agricultural society, on Thursday, elected John Merriman, of Maryland, president of the society. Professor C. V. Riley, of Washington, D. C., delivered an address on "Agricultural advancement in the United States," in which he declared that the Department of Agriculture was a disgrace to the country and the ridicule of the farmers. A committee was appointed to prepare a petition to Congress requesting that measures be taken to eradicate pleuro-pneumonia.

A NEW METHOD OF MAKING STEAM BOILERS.—An English engineer named Whitehead recently exhibited at Owlestan, near Sheffield, a boiler made on a new plan. In making this boiler a ring of steel is cast and heated; then it is placed upon a large roller, and by the aid of smaller rollers it is enlarged to the requisite dimensions. The ring is run from one end of the roller to the other, and is returned by reversing the machinery. The heads necessary for the completion of the boiler are subsequently put on with bolts. The machinery is rather expensive, and its cost which is said to be the point upon which the success of the invention hinges. The inventor claims that within six hours he can construct the shell of a boiler of a more durable nature than those now made with iron or steel plates riveted together. There is no doubt that such a boiler must be stronger, as the danger of tearing the seams on the cylindrical surface, where the strain is the strongest, is done away with by the total absence of such seams.

(Continued from page 54.)

be purchased here at a very low price. The Americans a short time ago doubtless effected a vast improvement in their manufacture when they discarded their system of heavy feeds and hot meal for ours of slower grinding and cooler meal, and they have been a little quicker than ourselves in generally adopting the high grinding system, which, after all, however, is a poor substitute for the gradual milling by stones, which, within twenty-four hours of Mark Lane, can be seen, thoroughly and systematically carried out, in any number of town and country Continental mills. I have examined these mills and their entire system, and have taken extracts from the grist books. So much importance do they attach to gradual milling that where there are not sufficient stones in the mill (and these are the majority) for the complete process to go on continuously, they first break the wheat, dress and sort it, until completed; but any of these millers I spoke to who have had experience of rollers in manufacturing with them, or, to their cost, competing against them, will confess that were it not for the cost of the change, or some other obstacle, they would at once adopt them. I believe that our superiority in milling will be attained by adopting details of our one, built up on the Hungarian foundation. The Americans are commencing to do, and must continue to do, the same. We will gladly look to the West for a large supply of our best wheats, but depend upon it the eastward position is the most orthodox one for manufacture.

THE GRADUAL MILLING PROCESS BY ROLLERS, ETC.

This consists of gradual reduction by rollers in connection with purifying and dressing. When the gradual reduction process is spoken of, the two last portions of the operation—gradual purifying and dressing—are somewhat lost sight of, whilst they suggest more completely than the first, the chief merits of the process; for the gradual reduction by rolls or stones is only made in order that the offals, (germ, bran, etc.) can be successfully eliminated, whilst both the flour and offal particles are in large pieces, and thus more amenable to the efficient operation of the purifiers, than is the case with our very fine middlings, produced by new process grinding, in which the gravity of the offal particles varies only infinitesimally from that of the flour particles. I should have had pleasure in going into the details of this process, but it will be sufficient for the purpose of showing in what direction its merits consists, to describe very briefly its principal features. The wheat, after being cleaned and ended, is cracked through fluted rolls and the products sized, dressed and purified. The cracked wheat is then again slightly reduced by a rather fine fluted roll, the products being again sized, dressed and purified. This is repeated a third, a fourth, and frequently a fifth time; the semolinas from these breaks are then crushed through rolls, usually with no differential speed, the flour particles, which are still attached to the bran particles, being as it were burst apart from the latter, which in turn being still large are easily taken away by the dressing machines and purifiers. The middlings are then crushed through smooth rolls with usually differential speed. After each reduction a simple sizing, dressing and purifying takes place. This system I have seen on the Continent applied to soft wheats; the tough bran admits of a differential speed being used for the semolina, and the reduction is thus much quicker, the flour portions falling far more freely into flour than the flour portions of hard wheat. A change set of wheels for the semolina rolls are all that is necessary to use for such of the rollers as are to work intermittently, on soft and hard semolinas, whilst the dressing machine need only be provided with enough silk for dressing the soft wheat products, and with double worms for "cutting off" when dressing dry wheat products, or a mixture of both. I wish to point out to you that in this system the short dressing reels (there are sizing reels also) for the very first breaks are clothed with very fine silk, but that flour—offal powder I call it—is here extracted, which with your system, in vastly larger proportions, goes into the flour. In the first three breaks with rollers this flour amounts to about 4.40 per cent and is very poor in quality, so poor, indeed, one would almost as soon think of returning shatter dust to the flour as of returning it. Another merit of the gradual milling system is that the germ is extracted very thoroughly; this has probably never been done more effectually than by Mr. Thomas Muir, of Glasgow, who showed you here at a previous meeting some samples of his germ meal.

PROFESSOR KICK.

The greatest writer on the roller system, Professor Kick, says in a communication received from him from my friend Mr. Throop and myself soon after the millers trip to Austro-Hungary: "If we compare the effect of rollers with that of millstones we will be convinced that rollers do not treat the bran so severely. The reducing of the bran by rollers is not a tearing, as in the old manner; there are not so many extremely fine particles of bran made which cannot consequently be separated from the flour. By employing rollers a much greater percentage of clean, good semolina and clean middlings, and consequently (ultimately) also of good flour is made." He further writes: "In the first break by millstone reduction, generally 6 per cent to 8 per cent of flour is made, consequently four to twelve times the quantity made by the first break of rollers." You will, therefore, see that even in using stones for the light breaking down action, the offal powder becomes mixed with a much larger proportion of pure flour. With gradual roller milling, though

none of the bran is large, but little of it is made into offal powder. To recapitulate the advantage of the roller system

RECAPITULATION.

1st. It admits of all the flour portion of the berry being separated from the offal portion, principally while they are both in large pieces.

2nd. It also gives you, if you require to keep it separate, a more valuable semolina flour than can be obtained by the ordinary methods.

If you forget everything else I say to you to-day, please remember this—that with your heavy millstones, with their large surface, operating by friction, you reduce the wheat in one violent, tearing, rubbing, fretting action, into a mixed mass of flour, offal powder, and offal, which can never afterwards all be separated the one from the other. You can see samples presently illustrating the depreciation caused by a fairly computed mixture of offal powder with pure flour. I show you a diagram of wheat between rollers. If the wheat passes through five fluted and five smooth rollers it amounts to little more than passing ten points. The diagram of wheat in the furrows of a millstone show that it has to pass several bevelled furrows which give first a snicking, then a partly rolling, partly frictional action, and it also has to pass over several inches of lands. A great deal of attention at the present time is being given to bran-grinding; some beautifully delicate machine is being sought to charm away the flour from the bran; Millstones are the most efficient in producing quantity of flour, but the quality is inferior. Remember that at present every pair of wheat-stones in your mill is grinding bran. Look at it in this light in the future—at one and the same time grinding bran and your best flour.

HIGH GRINDING BY MILLSTONES, WITH ROLLERS FOR CRUSHING MIDDINGS.

I enter on this part of my subject with feelings of reluctance, because in doing so I am guilty of bolstering up a failing system; but after having pointed out what I believe to be best, and knowing that numbers of millers throughout the country cannot for some time to come, from various reasons, adopt the complete roller system, I propose to show them how to modify their present system at the smallest expense. Since writing my paper, a gentleman, an extensive millstone miller (at present), who was aware I intended touching on this method of manufacture, wrote, urging me strongly not to be guilty of such an action, and he added (how disinterested was his advice): "I write as one fully believing it is to my interest to have the old system still believed in, because it gives users of newer and better methods, a better prospect of having opponents handicapped, by a faith in obsolete systems. The plan I am now going to speak of is not costly, it can be carried out in any mill however small, is suitable (as suitable as an "obsolete system" can be) for all wheats. Many of you at present work a similar process, it will therefore be necessary for me (as you are aware of the general features) to enter somewhat into detail, as it is the amount of attention to the details of the "new process" which makes or mars success.

GRIND EACH KIND OF WHEAT SEPARATELY.

Native, and the majority of foreign wheats must be ground separately if you wish to obtain the best results. No amount of drying will make the thick tough bran of native wheats thin and tender like much of the foreign, and no amount of heating will give the thin brittle Black Sea Wheats (for instance) fibre like our own, which it does not possess. I have ground many hundred cargoes, grinding each kind by separate stones, and am certain it is the correct system. To prove that I am right, work a stone on native wheat and then on a hard foreign wheat, and you will immediately have to raise the stones, or *vice versa*. I have done this daily for years, and know what I am saying is a fact. The meal from each pair of stones falls, in the usual way, into a general worm, and all is dressed together. This leads however, to somewhat imperfect dressing, and consequently in some mills they grind first one kind of wheat on all the stones and dress it; then all the stones and dressing machines go on an other kind, the dressing machines, like the stones, being properly inspected and adjusted. The flour from each kind of wheat in this case falls into a separate hoppers room, from whence it is drawn off in correct proportions and mixed in a mixing machine. A trial of the mixed flour can be made before drawing off, and a satisfactory mixture arrived at.

SOFTENING HARD WHEAT.

At one time I damped all hard wheat, and did so to advantage, for the low grinding then in vogue. I must, say however, that I believe the wheat heaters which are now being introduced are an improvement, as they give toughness to the bran, whilst extracting moisture from the grain. The use of heaters to toughen the bran does not quite tally with the middlings making theory; but middlings making with millstones is at the best but clumsily and imperfectly done, and in my opinion heaters to a certain extent mitigate the too rough action of millstone on the bran.

DRYING SOFT WHEATS.

Our native wheats I would strongly recommend being dried, when in the condition in which it comes to the mill this year. Drying does not injure the grain in any way; and if it is wheat which was properly matured, and merely became wet while cutting, it gives back a great part of its intrinsic excellence. If the wheat is not matured, as is the case of most of this year's crop, drying does to a certain extent mature it. Old native wheat is more valuable than new, simply because it has in the stack been subject to a slight warmth or sweating; has, in fact, been drying. Dr.

Graham intends informing the bakers how to improve the bread considerably that is made from immature wheat flour; but so far as I recollect, he told me the wheat must be subject to drying before grinding. The heat of wheat on the kiln varies in practice from 70 deg. to 100 deg. Fahrenheit. The waste in ordinary years varies from 1½ to 7½ per cent, but this year in some districts from 5 to 10 percent. according to the experience of Irish millers from 10 to 15 percent. A very excellent Irish kiln was invented by Mr. Armstrong, of Belfast. Another good kiln which is highly spoken of by millers who use it in this country, is that illustrated on the wall (Jones patent).

FUMIGATING HEATED WHEATS.

Do not think that kilns are only used for drying native wheat. They can be used to advantage for drying washed Egyptian wheat, and by a slight modification for fumigating heated foreign wheat. If a cargo of the latter be only slightly heated the smell will be entirely removed by putting a certain quantity of sulphur and sal-ammoniac on a clear fire and allowing the fumes to pass through the wheat. I have treated cargoes in this manner.

GRINDING.

The wheat having been properly prepared and cleaned, we have to consider the grinding. And now I ask you for the remainder of this afternoon to set aside, as the main object of our meeting, the fashionable parrot-cry of the day—"I want to make as many middlings as possible." Let us say rather—"I want to make flour as free from offal powder as is possible with millstones. Making middlings (bad middling) is very easy, but good middlings are and must be produced in order to make good flour; but it is utterly impossible to make a good profitable, general run of flour from wheat that has been maltreated in grinding, as some of it has been lately under cover of new process, and in attending to all risks to "make middlings." If you are shown over a new mill now your whole attention is directed to the middlings. May I suggest it would be better for the miller to look more at his flour, especially his first run. He must do more than this, however; he must compare it carefully with his competitors' flour. A diamond merchant never buys a diamond by judgment, but compares it with a standard stone. Every miller is apt to think his own flour the best unless he compares it with other brands.

MILLSTONE.

Some time since I tried fixed irons in the mill of one of your members; the Americans have late called attention to the subject; we made a number of experiments. Our arrangements perhaps were not quite satisfactory, but sufficiently so to give an approximate result. We anticipated, at least, an increase of 10 per cent of middlings over balanced stones; the result was nil, and we attribute it to so much of the weight of the stone being carried by the wheat, that the runner, as it were, becomes unsteady on the irons; it also is more troublesome to keep in order than the balanced stones. In shelling oats and ending wheat, from which the idea originated, the operation is a light one, no appreciable pressure of the stone being required. Great attention must be paid to your stones and their gear, above all else the collar must be kept tight, the irons must be in perfect grip, and the runner be balanced each time the stone is dressed. In a mill I managed for some years, the runners were all balanced and the driving iron grip tested each time they were put to work. An advertisement which says the patent balance is more necessary now than ever, is modestly within bounds. Unless you are putting in new stones I would not advocate any great alterations in dress; running the short furrows into the master furrows assists ventilation, and is in this way of great service. If you increase the number of furrows too much and the amount of draught, you cause too much of a shearing, tearing action from the feather edge of the furrows. If in addition to this, you grind very high, you produce a short, curled bran, full of rough jagged edges, from which much offal powder has been torn, and which is irretrievably mixed with the first run flour, where it can be seen, but from whence it cannot be separated. Great draught and many furrows get rid of the wheat quickly, and a large feed is frequently put on such stones, but this is a mistake, as a large feed necessitates great pressure, and hence the desired cutting action of the furrows is lessened, the bran instead, being unduly crushed, whilst at the same time the miller is satisfied, because the stones are sufficiently far apart to allow the much coveted middlings to be produced. I am anxious to be understood on this point as it is important. Some millers appear to think that because their meal is fairly cool, they can put almost any amount of feed on the stones. The new style furrows intended to granulate are at the best but blunt and imperfect appliances, and in fact, effect, more by crushing than cutting; and for every round of feed put on, with the application of a corresponding weight of stone, crushing and tearing, i.e., the manufacture of offal powder is going on. Let any miller who is grinding at the rate of 10 cents per hour, with the view of granulating, reduce the feed to 5 cents per hour, and in order to ascertain what a vast amount of pressure he has been using, let him note how many rounds he has to raise the stone. On the Continent, where gradual reduction is carried out by millstones, the wheat is very slightly touched by each operation and little pressure results. A dress very similar to our own old dress is used, and the face of the stone more relied on than the furrows. I am desirous that bran from millstones shall be as large as possible because you cannot tear large pieces of bran into small by a millstone without producing

bran-powder. I believe, on the contrary, that a great deal of snicking and tearing of the envelope of the wheat is done by the furrows when they first begin to grip the firm berry, and that whilst they granulate middlings, they murder bran; and that also with widened furrows and narrowed lands, what is left by the latter, having less surface to work with, necessitates more pressure, I prefer that the wheat be crushed more before going to the stones, so that it will yield before the first grip of the furrows, and pass on to the land, with little cutting up. Have only moderate draught, so that the furrow will not have too much shearing, but rather an "opening" action, and have a short grinding surface. The method will not grind fast, but with a light feed it will not require pressure, and will give large bran. Keep the face of your stone finely and lightly dressed. If these instructions be carried out first-run flour will not be specky or muddy in appearance, after all, and your middlings will be sharp and round. Remember, after all, every portion of the product passes over the lands, and that the size of your coarsest will correspond with the thickness of your bran.

DRESSING.

This operation is only second in importance to grinding, but no amount of fine silk can remove all the bad products of bad grinding. The coarse offals should be separated from the semolina, middlings, and flour in the first machines, the offals being then put through the bran duster and sized according to requirements. The second set of machines should take out flour, and each of them be provided with double worms for "cutting off" at any spot required. Corresponding machines (if necessary) take more flour from the middlings, and these should also have double worms because if dressing foreign meal a short length of them may only be required, whilst a length of silk must always be in reserve if there is a mixture of native meal. The next machines must have somewhat coarser silk, through which will come all the produce too coarse for flour and too fine for purifying. This should be crushed at once through rollers. I believe few millers know the advantage to be obtained by thus treating this portion of product—it is a portion that at present usually goes into two wrong channels: part is going into the flour, which it darkens, and the remainder to the purifiers, the latter dividing its attention between choking the silks and getting into the stove-room. If the previous machines have been reels, not centrifugals the middlings from them should now, at any rate, pass through dusting centrifugal. They must then be sized in readiness for the purifier. The double worms under dressing machines are believed in this country to be used in America for returning specky flour to the head of the machines to be redressed. Whether it be the American practice or no, no greater mistake can be made; no flour should be returned, but a separate machine provided to redress the cut offs. The middlings crushed by the rollers, it is better to dress through centrifugals, the flour from these will meet the first run (meal) flour, if a "general run" is being made and all should pass together through centrifugal machines for a final dressing. The above system cannot be taken as anything but general in its application, as everything depends on the quantity of material to be operated on; the arrangement, however, refers pretty accurately to either reels or centrifugals. To conclude this part of the subject, do not trust to the theory of chances in flour dressing, but if you want flour of a certain size use suitable silk; the numbers used in some mills is really amusing, and I am not surprised at millers complaining that the flour through their fine tail silks is so dirty, because there is little in that part of their reels but dirty stuff to come through. This is not an argument against long reels, but wrong silks. Two numbers of silks for flour are sufficient on almost any machine.

MIDDINGS PURIFYING.

The middlings being once thoroughly dusted and graded will be easily dealt with by some of the many good purifiers with which you are well acquainted. Remember this, that the more thoroughly you purify the coarser you can dress your best middlings flour. Our coarsest middlings being small, none of them can be absolutely pure like the Hungarian. It is a pity that the great ingenuity successfully employed in making purifiers for fine middlings had not been engaged in producing large middlings by gradual reduction. Bran grinding should have been the next part of my paper, but I have had but very little experience of bran grinding, though two or three gentlemen have been kind enough to experiment with some machines I have constructed for the purpose. I do not therefore, touch upon that part of the subject, preferring to listen to the remarks that will fall from those who follow me.

ROLLING MIDDINGS.

The advantage of rolling middlings instead of grinding by millstones I do not stop to argue, it is an acknowledged fact that rollers are by far the best. The middlings of various qualities, should, in mills of sufficient size, be crushed through different rollers, and be separately dressed. The large mill I have lately started, was for Messrs. White, Bros., Muckamore Ireland, and is worked on pretty much the system I have now described to you. The purifiers used were, Garden City for fine middlings, and No3 Haggenmacher machine for coarse.

I thank you very much for your kind attention to me during the reading of so long a paper. (Cheers.)

A lengthy discussion followed the reading of Mr. Carter's paper, which was resumed at the dinner, which took place in the evening.

NEWS.

EVERYBODY READS THIS.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Nordyke & Marmon Co. of Indianapolis, Ind., are remodeling the mill at Glenwood, Ind., to the new process.

Tabler & Maxwell, of Cedarvale, Kan., have awarded their contract for a four-run mill to Nordyke & Marmon Co., of Indianapolis, Ind.,

C. C. Shelton's mill at Chattanooga, Tenn., is being extensively altered and improved.

A handsome new-process mill is being built at Walkerton, Ind., for Alexander T. Wallace.

Jas. Turner, of Lansing Mich., is enlarging his mill.

The Director of the United States mint reports that the yield of the precious metals in the United States and Territories, for the year 1879 is as follows: Gold, \$38,900,000; silver, \$40,812,000.

Green & Hunter, Decorah, Iowa, have a 7-run water-power mill.

The Vulcan Iron Works in St. Louis will start up soon, and 2,000 men will be employed thereby.

Minneapolis parties are negotiating for Austin's water-power at Fergus Falls, Minn., and if purchased will erect a 20-run mill soon.

The Marine Boiler Works, Richard Davis proprietor, are making four new steel steam boilers for the Phoenix Mills of Milwaukee Size, 66 inches by 16 feet.

A correspondent says that the mill of McMahon & Co., at Griggsville, Ill., is one of the best in that section. It has four run of stone and is run by steam power. Many improvements have been made this season and the mill is running full time on orders. J. W. Dorsey is the head miller and L. M. Kennedy engineer.

The Kansas City Board of Trade is reported to be increasing its number of members, and is flourishing generally.

Extensive emery beds have been discovered near Peekskill, on the Hudson, N. Y. It is said to be equal in quality to any ever found.

The mill at Cadiz, Ind., owned by W. P. Cooper, is being altered to the new process.

Nordyke & Marmon Co., of Indianapolis, Ind., are remodeling the mill of W. H. Starr, of Howard, Neb., to the new process, and adding additional machinery.

Prater & Hoy, of Tiblow, Kan., have contracted for a two-run flouring mill with all modern improvements.

S. Obermayer, of Cincinnati, O., has purchased two run of buhrs and appurtenances, to increase the capacity of his mills.

Josephs & Anderson, of Montgomery, Ala., are adding new buhrs to and fixing up their mill generally.

John A. Thompson, Esq., of Edinburg, Ind., is enlarging his mill and increasing its capacity with buhrs and other machinery.

S. & J. C. Sterne, of Princeton, Ind., are building a two-run flouring mill by the side of their elevator.

Gallipolis, Ohio, is to have a new flouring mill, G. W. Clark, of that city, having contracted with Nordyke & Marmon Co., of Indianapolis, Ind., for a first-class, 3-run, new process steam mill.

J. Richmond, of Mattoon, Ill., is building a 4-run new process mill. The entire machinery has been purchased of, and is being constructed by, Nordyke & Marmon Co., of Indianapolis, Ind.

Jas. Young, of Bloomington, Ind., is adding two run of buhrs to his mill and remodeling it to the new process.

Laning & Hunter, of Doud's Station, Iowa, are adding considerable new machinery to their mill, including purifiers, etc., and fixing up generally.

A large, fine merchant mill is being built at Rood House, Ill., on the line of the new railroad from Indianapolis. The purchaser of the mill is Ellis Briggs.

Only 13 flour mills are now in operation in Rochester, N. Y. Thirty mills have been built there, but 17 have been changed into other manufactories, or have been burned.

The Eau Claire Lumber Co., of Eau Claire, Wis., have ordered two of Gray's patent roller

machines from Ewd. P. Allis & Co. They will go into their flour mill lately rebuilt at Eau Claire, Wis.

J. B. M. Kehler's model mill at Edwardsville, Ill., starts up Jan. 1st, 1880.

Squirrels are threatening to become as great a pest in Tennessee as they have been on the Pacific coast.

Ewd. P. Allis & Co. have just shipped 4 of Gray's patent belt roller mills to Jno. Farlay & Sons, of Cork, Ireland.

The Reliance Works, Ewd. P. Allis & Co., proprietors, of Milwaukee, are running day and night with a force of about 600 men. Their orders are at present chiefly from parties who are changing over their mills to the roller system of gradual reduction, of which Allis & Co. make a specialty.

White, Nash & Co., of Lanesboro, Minn., have ordered two of Gray's roller machines from Ewd. P. Allis & Co., Milwaukee.

The Star and Crescent Mills, of Chicago, have lately put in 17 porcelain and grooved iron roller mills, all ordered from and put in and arranged by Edward P. Allis & Co., of Milwaukee.

E. Sanderson & Co., of Milwaukee, have ordered a number of Gray's patent grooved roller mills from Edward P. Allis & Co.

C. A. Pillsbury & Co., of Minneapolis, have ordered a large number of Gray's roller mills from Edward P. Allis & Co., Milwaukee.

Edward P. Allis & Co. are building 30 bran aspirators for Minneapolis parties.

Jesse Ames' Sons, of Northfield, Minn., are putting in two more grooved roller mills ordered from E. P. Allis & Co., Milwaukee.

Edward P. Allis & Co. have the fine new mill of E. L. Archibald & Co., of Dundas, Minn., nearly ready to start. This will be one of the finest mills in the United States.

The Milwaukee Middlings Millstone Company have shipped three cars of machinery to Denver, Colorado, during the past week, for J. K. Mullen & Co., whose mill they are remodeling.

The Milwaukee Middlings Millstone Company have contracted to build two new mills in Pennsylvania.

The Milwaukee Middlings Millstone Company have shipped on an average two of their little mills every day for the past two months, and the demand for them is steadily increasing.

The Milwaukee Middlings Millstone Company have now completed the new mill of Messrs. Schlegel & Koenig, at Saukville, Wis.

The new 600-barrel mill which the Milwaukee Middlings Millstone Company are building in Milwaukee will probably be ready to run Feb. 1st.

Robert G. Woods, of Eufala, Ala., has ordered two of Gray's patent noiseless rolls of Edward P. Allis & Co., Milwaukee.

Fitzsimmons & Kreider, of Jacksonville, Ill., have ordered another porcelain roller mill from Edward P. Allis & Co., Milwaukee.

The Witbeck Lumber Company, of Chicago, have ordered a 26x48 Reynolds-Corliss condensing engine for the Marinette Mill, of Ed. P. Allis & Co., Milwaukee.

John Furlong & Son, of Cork, Ireland, have ordered a number of Gray's patent roller machines of Edward P. Allis & Co., Milwaukee.

Edward P. Allis & Co. are changing over a great many mills to the roller system with the most satisfactory results, and the large new mills that they are now making frames for will embrace this system entire. It is equally well adapted to hard or soft wheat.

A boiler explosion at the Aetna flouring mills in Springfield Ill., December 29, filled the neighborhood for two blocks around with splinters, bricks and fragments of iron. The only person on the street injured, was a lady, and she only slightly, by a falling brick. The buildings in the vicinity were considerably shattered. Glass windows were destroyed for several blocks. Damage about \$20,000 in all. The dome of the boiler fell on the roof of the Western Union telegraph office, and passed down to the third floor. None of the men in the mill were injured, but the engineer, who is missing. His hat was found on the top of a building two blocks off, and it is thought his body will be found on some other building. His name is Rædder, and he is fifty years old. Cause of the explosion not known.

SUBSCRIBE FOR THE UNITED STATES MILLER. Only \$1 per year.

Deaths, Fires, and Casualties.

Horace Clarke's mill at Peoria, Ill., burned Dec. 20. Loss, \$37,000. Insurance, \$17,000.

George Yergan, a watchman in Freeman & Co.'s mill at LaCrosse, Wis., on the morning of Dec. 23d, while attending to his duties in the cupola, was caught by a shaft, twisted and twirled round several times, his right leg and arm crushed to a jelly, and nearly all his clothing torn from his body. It is thought the man cannot recover.

The flouring mill of J. Schreiner, at Manchester, Mo., burned at 4 o'clock a. m., Dec. 3d. Between 30,000 and 40,000 bushels of wheat and a considerable amount of flour was also destroyed. Loss about \$50,000. Insurance, \$33,500.

A rotten old mill owned by Allis Packard, at Brocton, Mass., fell down Dec. 5th, under the pressure of grain stored therein. Three men were buried deeply under the corn, and when taken out were dead. Their names were C. A. Nourse, Dennis Lynch, and Dennis Reardon.

The flouring mill of Samuel Hill & Bro., at New Athens, Ill., burned Dec. 8th. Loss on mill and machinery, \$25,000.

D. D. Carpenters & Wagners mill at Janesville, Minn., was destroyed by fire Nov. 29th. Loss, \$12,000; insurance, \$6,000.

J. Morton Poole, of Wilmington, Del., died No. 25th, 1879.

Allen Lawton's flour mill at Stone's Prairie, Ill., burned Dec. 15th. Loss, \$10,000; no insurance.

The steam flouring mill at Saugatuck, Mich., burned Dec. 7th. The property belonged to Mrs. G. P. Heath. It is supposed that the fire originated in the engine room. Loss, \$3,000; insurance, \$1,000.

Foreign Items.

Floods and very severe weather prevailed throughout Hungary during the early part of December.

The case of Wegmann vs. Corcoran was finally decided in the Court of Appeals, England, Nov. 10th. The case was argued at great length, last June, in the Court below and a decision adverse to the plaintiffs was rendered from which an appeal was taken, which, by the ruling of the Court, was dismissed with costs. Roller mills are now considered public property in Great Britain.

Buda-pesth, Hungary, has four million dollars invested in flouring mills.

The Spanish Government has concluded to allow imports of breadstuffs, duty free, until another harvest.

A cargo of wheat from Siberia was recently received at Bremen.

The 1879 harvest in Italy was a failure. Imports will be quite large.

Messrs. Huntley & Palmer, the celebrated English bakers and biscuit makers, employ 3,000 hands. They were awarded a grand prize at the Paris Exhibition. In comparing the English and French products the *Bakers' Record* says: "French biscuits are sweet, showy and succulent; but after a day or two *c'en est fini avec eux*. They lose their gloss, their flavor and their crispness, and become limp, sour, dry and tasteless. The English biscuits, scrupulously prepared and as scrupulously packed, will defy time and climate." The only gold medal in the Alimentary Department awarded to an American exhibitor is that given to Duryeas Maizena, manufactured by the Glen Cove Company, of New York, U. S. A., which produces upwards of 60,000 lb. weight of this food, prepared from American maize, every working day.

The milling industry is quite lively in Austria. Among the recent large steam mills built are those of Messrs. Schoeller & Co., at Ebenfurth; Vonmiller & Co., in Vienna, on the Danube; and Mayer, Kraus & Sohn, in Pesth. All these mills are using the celebrated roller mills made by Ganz & Co. of Buda-pesth, Hungary.

The demand for the well-known chilled iron roller mills, manufactured by Ganz & Co., of Buda-pesth, Hungary, has so greatly increased that they have been obliged to greatly enlarge their mill building works.

Messrs. Ganz & Co., of Buda-pesth, Hungary, have recently added to their line of specialties an electro-dynamic light, used for lighting mills and manufactories and also for use when threshing grain by night. It is being extensively introduced and gives great satisfaction.

Eleven thousand tons of wheat and 6,000 tons of other grain were imported into Italy during the first ten days of November.

The Riverside Mills.

M. T. BOULT, APPLETON, WIS., PROPRIETORS.

Mr. M. T. Boulton has just completed the erection of a very handsome waterpower flouring mill at Appleton, Wis., and we take pleasure in inserting here a description of it taken from the *Post* of that city:

The Building is one of the finest looking and most substantial upon the river. Its dimensions are 40x60 feet and four stories high. It rests upon a solid stone foundation, started on the immovable bed rock. The frame is a most excellent and massive one and that it is very substantial will be admitted when we state the amount of lumber utilized in the building amounts to upwards 200,000 feet. The building is double sheeted nearly all over. It is veneered with brick, is covered with a splendid iron roof and will have iron shutters upon the exposed side. The building is thus practically fire proof, as far as the exterior is concerned. The machinery is all new and first-class and adapted to the modern and highly improved methods of milling. It will not be out of place to enumerate some of the principal machines. First, the power is derived from two Leffel Turbine water wheels which afford an aggregate capacity of 140 horses—or a much greater power than is required to operate the mills. The mill is designed for five run of stone, four of which are already in and ready for operation. The burrs rest upon iron husks, and the latter upon solid stone piers, built upon the bed rock. This in a most important arrangement as their can be no motion to the machinery other than what is desired. The mills are provided with two flour packers—one for straight and the other for patent grades. There are four grain cleaners as follows; one Eureka warehouse separator, one Victor smut-ter, one Victor brush and one of Kurth's cockle machines. When the grain passes through these all impurities have been removed and it is ready for the manufacturing process. The mill is also provided with a complete system of rollers or crushers and reducing machinery which is unnecessary to mention in detail, as well as with an elaborate and improved bolting system, which we need not describe. Upon the upper floor are three Excelsior purifiers which of course perform an important part of the work.

In the course grain department, there are provided a corn sheller, meal bolt and other facilities for the advantageous manufacture of feed.

The burrs are driven on the reel belt system and the pulleys are so proportioned as to utilize the power in the most economical manner.

The machinery has all been furnished by the well known firm of Hurlburt & Paige, of Painesville, Ohio, and the putting of it in, as well as the millwright work in general has been under the supervision of their experienced and skillful millwright and engineer, Mr. H. Watters of Akron, O., assisted by his son H. A. Watters. A competent corps of workmen has been employed under them and the work has been done in the most thorough manner from the foundation up. Being provided, as it is, with the very best of facilities for manufacturing, of course the best results must follow, and such as will inevitably prove satisfactory to its patrons as well as to its proprietor.

The establishment really amounts to two independent mills, each being distinct and separate from the other. One wheel drives the feed and course grain department and the other wheel will perform the merchant work. A specialty will be made of custom work, and we can assure the farmers that they will be dealt by at this establishment fairly and courteously. In the merchant department the very best brands of flour will be manufactured, which, of course, will command ready and extensive sale in this community.

We venture nothing in saying that, as a whole, this is one of the most complete and superior mills in the state and that it will merit a liberal patronage, in this city and vicinity, we have no doubt whatever. The site is one of the most available and desirable that could possibly be selected for this purpose. It is at the head of the principal thoroughfare leading to the waterpower and is most accessible to the farmers and the public generally. And then at the rear of the mills is a spur of the C. & N. W. R. R., where grain can be delivered and the manufactured products received with but very little labor.

The "Riverside Mills" is the enterprise of Mr. M. T. Boulton. He has given his personal attention to the general supervision of the work from the first and has managed it with skill and energy which are very praiseworthy. It is the intention of the proprietor to devote his entire time to the management of his business in the future and in his hands it is destined to succeed in a very marked degree.

Is Labor-Saving Machinery an Evil?

The Cincinnati Gazette says the displacement of human labor by machinery is attracting the attention of 'prentice hands in political economy, and has led them to think that all which we call progress is on the wrong track. The process of reasoning in this is so exact and arithmetical that it may be called scientific. Take, for example, the reaper. With a span of horses the farmer sits and reaps as much grain in a day as seven men could "cradle." Is it not figuratively demonstrated that that reaper throws six men out of work, and reduces them to tramps? So a threshing machine, with a little steam engine and six hands, will thrash as much in a day as forty flailers; thus thirty-four flailers are thrown out of employment.

These scientific statistics are equally fearful in every branch of labor. In all these man's invention is destroying man's livelihood, and the new political economy makes human genius a process of social suicide. The factory spinning and weaving machines will each spin and weave as much cloth as may be a hundred good wives would make with spinning-wheel and hand-loom. Thus each machine takes away the occupation of a hundred good wives. The saw-mill, with water or steam power, and a couple of good men, cuts as many boards in a day as a hundred men could cut with a hand-saw or a two-man pit-saw. Thus ninety-eight men are thrown out of sawing work. The farmer of our time is not the hero of the osculatory plays of our childhood, who sows his seed "broadcast" with the hand from a bag strung upon his shoulder and then turns round and views his land, and waits for a partner; but now he sits on a seed-drill with wheels, and drives a span of horses, and sows as much land in a day as half a dozen men would sow by hand and cover with the harrow. This makes the harrowing tale of five men with large families turned out of work by one machine drill.

The sewing machine is a still more harrowing invention by reason of its enhancing the hard fate of women. The invention of clothes, which came in through woman's fault, has been a blessing to women by continuing a need for them after the earth has become populated, and the original need had greatly diminished. But in an evil hour the devil instigated man to invent the sewing machine, one of which, as we learn by their seductive circulars, will sew as much in a day as a dozen women can do with the hand needle. But we will allow half for the exuberance of language, and say half a dozen. This leaves five sewing women reduced to the state of surplus by each machine. It affects not only the employment and wages of single women, but the demand on them for general family uses. And sewing is peculiarly the recourse of widows whom men unconsciously load with children, and then leave unprovided. Averaging the widows of five children each, one sewing machine deprives twenty-five children and five widows of bread.

We might go through the whole list of machines in this way and show how each is robbing mankind of employment. And the anticipation of the future is a multiplication of the realities of the past. That which invention has achieved in labor-saving machines gives unbounded anticipation of future achievements, and our sucking political economists reckon that in the course of this and the first quarter of the twentieth century, machinery will automatically do all the work, and there will be little or no call for human labor. Thus the progress of the age, which we are wont to boast, is in reality to destruction. There will be no use for mankind as producers; and as without producing they will have no means to buy for consumption, the working classes will all be surplus population, and an evil to be got rid of. As the rainbow is a standing sign that the deluge shall not come again, the

only available remedy is a general burning. Thus by human invention are we fetching on to the world's conflagration.

But these scientists do not go near to the bottom. The grain-cradle with which they compare the horse-power reaper is itself a labor-saving machine, and has thrown its quota workmen out of employment. One man with a cradle can reap as much as six men with the sickle. Thus each cradle took away the subsistence of five reapers, who with their wives and children, make forty souls, and as many mouths. But the sickle is a labor-saving machine. It threw a larger proportion of men out of employment than any subsequent improvement in reaping. One man with a sickle would reap as much grain as a dozen men could pull up by the roots, or twist off by the hand. The destruction began with the invention of the sickle or other knife, and no reform can reach the evil which does not abolish that, and let men pluck up the grain by the hand.

Likewise the flail is a great labor-saving machine over the plain stick, torn from a tree. Several men went out of employment on each flail. And the stick was a labor-saving machine over rubbing out the grain between the hands. By restoring these natural methods, each workman would have full employment in raising, pulling up, and rubbing out the grain for his own eating. This would remove the evils of surplus laborers in all that line, and also the surplus food, and of the producer having any to spare. The hand-loom and the hand-spinning wheel of the household were great labor-saving machines over hand twisting and platting, and must have thrown out of work a fearful number of wives.

Terribly as the sewing machine has deprived women of work, it has not been so bad as the invention of the hand steel needle. Before that, with bone needles—which of themselves are labor-saving machines—or with no piercing tool but their teeth, three or four wives might be sufficiently employed in making up one man's rude garments, whereas such facility was given to this by the invention of the steel needle that he hardly had a need of one wife. This gives us a frightful realization of the number of wives that might have been but for the invention of the needle. The invention of a wheeled vehicle has thrown out of employment an army of men who might earn a living for themselves and large families by carrying things on their backs. The hand or pit-saw was a labor-saving invention of larger proportions than the saw-mill. Before that there were no boards, save such as hewu, and none at all before the invention of that tremendous labor-saving machine, the axe.

Thus if we look through every branch of industry, from the simplest agricultural to the most complex skilled labor, we shall find that the very beginning of work has been to throw workmen out of employment; and that as it has progressed it has the more and more taken away employment from men and women. By the rights and logic of this political economy the greater part of the workmen should be without work—the "working class" should be the idle class. Somehow it has not worked that way. Somehow, with the invention of labor-saving machinery, employment has increased, and with all our progress in this line there was never a time when all who will work had fuller employment than now.

But a system of political economy which founds itself on a scientific basis of statistics is not to be cast off because the facts are contrary. Scientifically these men and women are out of employ, and if not so in fact it is because they are not in harmony with science. And these pessimist scientists can give good reasons for these vagaries of mankind from logical results. They can show that as their system, which would take from the hand of man every tool, would give to each one sufficient employment in searching for his own

living, and would make each one the consumer of all he produced, so with the invention of machinery the consumption of the laborer has extended in to all the products of machine labor, so that the laborers themselves have increased the consumption with the increase of production by machinery.

They might also point out elements not included in their scientific system, such as the vast employment given to workmen by making the machinery which saves labor, and the immensity of the carrying industry and of other multiplied industries which have been created by this immense increase of production by machinery. Thus they can discover excuses for the non-working of a theory which seems so complete and so scientific. And perhaps this will put into the noddles of these beginners in the science of public wealth a notion that their complete theory, founded on the scientific basis of statistics and arithmetical proofs, took in only a little part of the situation.

John Hammergreen has sued the proprietors of the Capitol Mills, of St. Paul, Minn., claiming \$10,000 damages as the result of injuries he received by the falling of an elevator in the mill in which he was an employee.

Montana has been heard from, and the exhibit which that Territory makes in grain-growing is splendid. In one of the counties wheat averaged fifty-three bushels to the acre. In another county (Jefferson) thirty acres averaged fifty-nine bushels. Oats turned out sixty to one hundred bushels to the acre; barley, forty-five bushels. All the grain is of first-class quality. It is interesting in this connection, to remember that Montana is three times as large as New York State.

The New York Produce Exchange have postponed the adoption of the cental system to Jan. 10th, and it seems probable that on that date it will be postponed indefinitely.

Philip Henck's new steam power mill, with three run of stone and one set of rolls, at Chaska, Minn., has started up. J. G. Eitel, of the same place, has been making considerable improvements.

C. R. Knickerbocker, of Jackson, Mich., who recently visited California for his health, has returned quite well, and undoubtedly managed to make a profitable trip, financially, out of it also.

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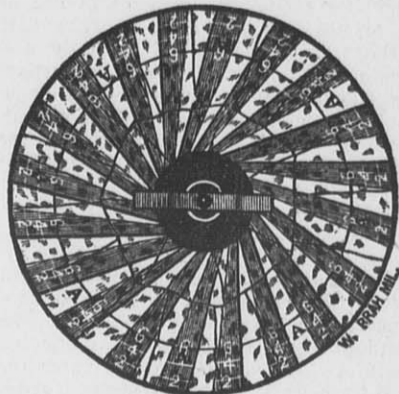
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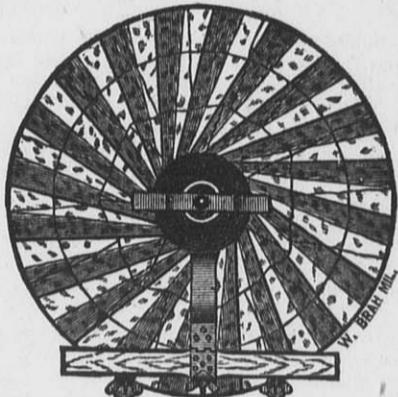
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WHAT THE MINNEAPOLIS MILL OWNERS THINK.

Minneapolis, Minn., Dec. 16, 1879. To whom it may concern: We, the undersigned, mill owners of this city, having purchased of Mr. Wm. Lehmann, his Improved Bosom Staff, and the right to use his method of truing the faces of mill stones in our mills, are pleased to say that we are using the same in our mills and that we regard both as valuable inventions.

E. V. White & Co.
Crocker, Fisk & Co.
G. W. Goodrich & Co.
Russell, Hinesline & Co.
Chas. A. Pillsbury & Co.

WHAT THE HEAD MILLERS THINK.

Minneapolis, Minn., Dec. 17, 1879. Wm. Lehmann, Milwaukee, Wis. DEAR SIR: We have given your staff, and method of truing the faces of mill stones a good trial in the Pillsbury and Anchor mills, and find them just as you have represented. The boys think it is the simplest and best thing they have seen in milling for a long time. Yours truly, C. G. Hoyt, Head miller, Pillsbury and Anchor Mills.

Minneapolis, Minn., Dec. 11, 1879. Mr. Wm. Lehmann: We are using your staff every day, and the more we use it the better we are satisfied that it is what every miller needs to keep his buhrs in prime condition. Your staff is the best we have ever seen. F. D. Zimmerman, Head miller, Union Mill.

Office of Crocker, Fisk & Co. Minneapolis, Minn., Nov. 21, 1879. Mr. Wm. Lehmann: DEAR SIR: In answer to your inquiry as to my opinion of your method of staffing mill stones, I will say that I consider it to be the only scientific way of staffing, and as it is founded on true principles must be correct. Your Bosom Staff will speak for itself. Yours respectfully, J. F. Stephens, Head miller.

Office of Model Flouring Mill, Minneapolis, Minn., Dec. 18, 1879. To whom it may concern: This is to certify that we are using one of Mr. Wm. Lehmann's Improved Bosom Staffs, and his method of truing faces of mill stones, and consider them the best things for truing the faces of mill stones we know of, as it produces an even granulation and makes more middlings than any other method we have used. It will do all the inventor claims for it, and we recommend its use to all millers. Russell, Hinesline & Co., By James Robertson, Head miller.

Minneapolis, Minn., Dec. 17, 1879. Mr. Wm. Lehmann, Milwaukee, Wis. DEAR SIR: I am pleased to say that after a thorough trial of the method of staffing mill stones patented by you, I am fully convinced that it is not only a good thing, but the best method of securing the most perfect face on mill stones, I have ever seen. It secures the champion face on mill stones. I would not be without it. By its use a much larger percentage of middlings and a more even flour can be secured. You can refer to me at any time you wish. In regard to your bosom staff, I will say that it is indispensable, and will be appreciated by every miller. Yours truly, J. C. Menor, Head miller, Standard Mill.

Minneapolis, Minn., Dec. 16, 1879. This is to certify that I am using Mr. Wm. Lehmann's patent, and improved method of straightening the faces of mill stones, and in the general application of his staffs common sense is truly defined. Under his method and manipulation I confess myself agreeably surprised at the results. The stones grind cooler, produce more even and better flour, more middlings and cleaner bran. I will further say that the more a miller understands the art of stone dressing, the better will be appreciate the advantages derived from the use of the above system. I fully indorse its principles and know it must meet with complete success. No miller should do without it. Wm. H. Helfrich, Head miller, Empire mill.

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Flour as a Subject for Speculation.

It would no doubt be of great benefit to the millers if flour could be dealt with in our various boards of trade in the same manner as grain, pork, lard and cotton, but so far there has been no very decided effort made to secure this result. Recently the *N. Y. Produce Exchange* has taken up the subject, and in its issue of December 13th has this to say:

"In neither this country nor England have facilities for speculating in flour kept pace during the past dozen years or more with those for speculating in wheat, and in consequence the speculative element in the bread-stuffs trade has been increasingly concentrated in the wheat markets. It is only natural, therefore, and especially so in a particularly exceptional year like the present, that wheat should be maintained at such a speculative elevation of price as to leave the equivalent value in flour far above the market value of that article, and thus to a great extent, prohibit its manufacture except at loss. That the evil will ultimately disappear through a rise in the price of flour, or a decline in that of wheat, or that a proper re-adjustment of prices will in some such way be brought about is inevitable; but so long as the facilities for speculation and manipulation in our leading wheat markets are so much greater than in those for flour, such re-adjustments are likely to prove of short duration, and would in no event reimburse millers for past losses of time and money. In fact, with the promise next spring and summer of a reasonable good harvest in Europe and America from an immensely increased area, they have a fair prospect of working on declining markets during the last half of the current harvest year; and as the present distorted and unprofitable relation between wheat and flour prices was established in less than two months after the season had fairly opened, and has to a greater or less extent prevailed, the year as a whole seems to offer them little encouragement. Is it not plain, therefore, that the milling interests of our country are being crippled by the superior facilities the markets afford for speculation in wheat."

"What is the remedy? It looks to us simple enough, and the only wonder is that it has not been adopted long ago. Place the facilities for speculating in flour on our principal exchanges on a similar footing with those now in use for speculating in wheat. No good reason can be advanced why 'Rules and regulations' for dealing in 'flour options' cannot be adopted and practically carried out by methods similar to those that govern like operations in wheat, corn, pork, lard and cotton. And it is thought by some that the sooner the flour merchants of New York, Chicago and other prominent points inaugurate a movement of this kind, the better it will be for them and their constituencies. They claim that the volume of speculation in flour would thus be vastly enlarged, and as the markets would then be led by the speculative element the same as in wheat, prices of the two articles would work in much quicker sympathy, and as a rule, at near about fair equivalents."

The *St. Louis Times* has recently turned its attention to this subject, and its reporter has interviewed several prominent St. Louis millers and flour brokers on the subject, and they are unanimous in the expression of the opinion that if the proper rules and regulations for the inspection, grading, buying and selling of different grades of flour were adopted by the different boards of trade throughout the country, that flour could and would be more successfully and profitably dealt in, and the trade in it would be greatly increased. All agree that the establishment of call boards for flour would be highly advantageous to millers generally, and that they would be enabled to keep their mills constantly running instead of as now being frequently obliged to shut down or run at a loss. It is to be hoped that the St. Louis millers will get this matter under way, and that their example will be followed by all other great flour centers. To show our readers the opinions of the St. Louis men, we quote a portion of the interviews had by the representative of the *Times*.

Mr. Alex. H. Smith, of the Empire Mills, had given the subject some thought, and he was decidedly in favor of the establishment of the board.

"Do you think," asked the reporter, "that such a thing is practicable?"

"Entirely so here in St. Louis. Our grades of flour are admirably suited for option dealing. This, however, is not the case with any other flour market in the country. We have a splendid system of grading, and at the fourth annual convention of the Millers' National association held at Buffalo in June, 1877, the committee on grading and inspection of flour, of which I was chairman, made a report in which they advocated call boards for flour options. The president of the association, Mr. Bain, in referring to the suggestion of the committee, in his address said: 'Take the city of St. Louis for example. A buyer of wheat there, when he finds that the product of five bushels of wheat in the shape of a barrel of flour costs 2½ cents storage a month while the storage on the wheat would amount to 15 cents, with the insurance on the flour warehouse less than half that of the wheat elevator; that the flour by keeping will improve in value to an extent equal if not more than the cost of storage, insurance and interest, while the wheat does not improve with age;

show him too, that it is as easy and quick a matter to sell the grade flour as the grade wheat, and my word for it he will soon change his allegiance from wheat to flour.'"

"These views, I think," said Mr. Smith, "will be found correct wherever a practical test is made."

"It is the opinion of some persons, Mr. Smith, said the reporter, "that the amount of margin which an operator would be required to put up on an option deal in flour, would be a serious drawback to the success of the movement. Fifty cents per barrel, it is urged, might be a sufficient margin ordinarily, but frequently the transaction would not be deemed safe with a less margin than \$1.00 per barrel?"

"I think that is a mistaken view of the matter, but whether it is or not, it is no argument against flour options. Rules and regulations can be made to do away with any difficulty that may arise in regard to margins, just as they have been made in the case of pork, lard, cotton, etc."

"Do you think such a call board would be an advantage to the milling interest?"

"Yes. It would enable the millers to keep on grinding the year round. You see, for instance, the millers could buy March wheat if they could sell March flour and so on. At present there is no, or at least very little, speculative demand for flour, and we can only sell to meet the immediate demands."

"Do you think speculation in flour would have a tendency to keep the prices of wheat and flour more on a parity—that is make the prices of the two commodities more sympathetic than they are at present?"

"I think it would have that effect."

"And make the market better for the millers?"

"Yes; I think so."

"Do any of the markets of the country have a call board for flour options?"

"None. The grades of no other market except St. Louis would permit trading of that character. I don't say that I advocate the adoption of such call board, but my opinion is that it would be a good thing if properly managed. The people will speculate and I think would be better for them to deal in something that has intrinsic value rather than in stocks, as the tendency has been of late."

Mr. George Bain, of the Atlantic mills, did not consider the dealing in flour options as practicable as wheat options or options in other raw materials. Speculation, as a rule, was confined to raw products. "The great hindrance to flour options," said Mr. Bain, "is that the various flour markets of the country did not have a uniform system of grading. If they did then the greatest difficulty would be removed. Until the same grading system is adopted in all of the flour centers option dealing in flour will not amount to much. Still I would like to see the thing inaugurated, for it would have a tendency to fix the prices of wheat and flour so that the millers would not have to manufacture at a loss as they are doing at present. If flour could be operated with the same as wheat the speculative price of the one would keep pace with the other."

"Of course you are aware that there is some trading done on the exchange floor in option deals among the flour dealers?" said the reporter.

"Yes; in a quiet way, but it don't amount to much. With a regular call board, I have no doubt, but that such trading would be largely increased."

"You are not opposed then to the establishment of such a board?"

"On the contrary, I would like to see it done. I think it would be a decided benefit to our market. As you know I have just returned from a trip East, and while there I conversed with a number of millers and flour dealers on this question. They all favor flour options."

Mr. John Crangle, of the Yaeger Milling company, was present at the interview held with Mr. Bain, and he said his views in regard to such a board coincided with those expressed by Mr. Bain. He would like to see the movement inaugurated, but feared it was somewhat impracticable owing to the different systems of grading prevailing.

Mr. Charles Fritschie, a flour broker, favored the establishing of a call board. He said: "Let us make St. Louis a speculative market for flour, and if other cities wish to follow our example they can do so. St. Louis is the great manufacturing flour center of the Western country and the proper place for the inauguration of such a move. With our system of grading there is no difficulty in the way of dealing in flour options just the same as in pork, lard, corn and wheat. I think it entirely practicable, and I am decidedly in favor of such a call board. I see no reason why men who want to speculate can't come here and buy 5,000 barrels of flour as well as 5,000 bushels of wheat. European dealers already buy St. Louis flour to some extent by grade and the time will come when a call board must be established—the tendency is in that direction. The adoption of such a board would be of the greatest benefit to the flour manufacturers, but at the same time it would be a benefit to the entire trade."

Mr. Fritschie said he had talked with a number of flour brokers, and they were all in favor of a flour call board. He did not think any difficulty would arise in reference to margins, and fifty cents per barrel would be ample for all ordinary trading. Such rules and regulations could be adopted as would enable an operator to make himself safe in case of an unusual advance or decline. With a well regulated flour call board the millers could grind all the time and the price of flour would be made to sympathize more with that of wheat.

We have the right system of grading and

all that is needed to prove to the trade, speculative or otherwise, that flour can be handled to equal advantage as either grain or pork. I hope to see the call board inaugurated."

Mr. F. Hattersly, a flour broker, had not given the subject a great deal of thought, but he was in favor of the board. There were some difficulties in the way, but he thought they might be overcome after a few months of experience. One difficulty that Mr. Hattersly pointed out was the difference in flour known as "City Choice" and "Country Choice." "It is a well-known fact," said Mr. Hattersly, "that the city millers with their superior facilities, can make a better grade of flour from an inferior wheat, than the country millers. For instance, 'City Choice' can be made of No. 4 wheat, but the country millers use No. 2 for 'Country Choice.' Now if both country and city choice was sold simply as 'choice,' you see it would work an injustice to the country millers."

"But could not this be regulated by the adoption of a rule to sell as 'Country Choice' and 'City Choice'?"

"Yes, that could be done."

"Another objection," said Mr. Hattersly, "is that where flour is bought for actual use the buyer always wants to look at the samples and is not satisfied to buy 'on grade.' Mr. Hattersly mentioned what he conceived to be several other difficulties in the way of establishing a flour call board, but admitted that they might all be removed by proper rules and regulations. He said if such a board was established, it would be necessary to have the 'calls' so as not to interfere with the sales made by samples. He didn't see that any bad effects could result from the board, and if properly managed it would certainly increase the sales of flour."

The system of grading flour, as practiced in St. Louis, Mr. Hattersly regarded as the best in the world. It had been adopted after other flour centers had agreed on theirs, and the result was a system that was in a manner perfect. "It would be a good thing," said Mr. Hattersly, "if all the other flour markets would adopt the same system."

Mr. C. H. Chenot, with the firm of Chouteau & Edwards, flour manufacturers, said he thought a flour call board would have a tendency to increase trade, and it would enable merchants to get at the actual value of flour without running all over the city as they have to do now. "I am in favor of the board."

Mr. James Post, of the firm of James Post & Co., flour brokers, expressed himself as being in favor of a flour call board. "It must, however," said Mr. Post, "be established with regular rules, etc., the same as is adopted in the case of grain, pork and cotton. With a board properly governed the trade in flour options would quadruple in a short time. You see there is more or less dealing in flour options by the flour men, but they have no fixed mode of settlement at present which is binding on them, and of course this trading is very limited. What rules they have now are taken from those which have been adopted in reference to 'futures' in grain, pork, etc., and they exist only by common consent. A call board would keep flour moving, and country shippers would not be afraid to send their flour to market, as they are now, because they would know that it could be sold. It used to be that way in regard to grain before the call board system was adopted. The millers would buy up what wheat they wanted and then go out of the market. There was no speculative demand, and as a consequence the millers could cause a break in the wheat market most any time. Let the board be established and it will prove of great advantage to the trade of St. Louis."

Several other flour dealers and millers were seen, but their views being similar to those expressed above, it is deemed unnecessary to state them.

Wm. A. Harris, of Providence, R. I., has recently made many contracts for his celebrated Harris-Corliss steam engines.

The members of the Baltimore Corn and Flour Exchange have decided to erect a new building to cost \$400,000 to meet the requirements of increased trade.

A portion of the Empire Brewery, of Milwaukee, Wis., owned by the Ph. Best Brewing Co., was seriously damaged by fire on the morning of Dec. 22. A large amount of malt and barley was destroyed. Total loss about \$200,000. The brewing department was not injured and work was scarcely stopped. New buildings, superior in size and cost to those destroyed, will be built at once. The loss to the company above the insurance is said to be about \$30,000.

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FOR SALE—At Hill's Ferry, Hertford County, N. C., a valuable Sawmill, with fixtures, situated on the Maherrin River, a stream navigable for large boats. Also a large body of the finest standing pine and oak timber in Eastern North Carolina. Address B. B. WINBORNE, Winton, N. C.

STEAM FLOUR MILL FOR SALE—A steam flouring mill, located at Grand Haven, Michigan, two run, with room, power, and business for two more. An outlay of \$500 will put the mill in first-rate repair. Grand Haven is the centre of a productive and fast developing farming country. No other mill within fifteen miles of the place. The whole product of the mill may be readily sold at home. Facilities for receiving and shipping by lake and rail unsurpassed. Cheap and on easy terms. Call upon or address the First National Bank, Grand Haven, Mich.

FOR SALE OR LEASE—The old established flouring mill, known as "Armleders Valley Mills," near Georgetown, Brown County, Ohio. The mill has a good custom, three run of burrs, good water supply, with large brick dwelling, outhouses, stone stable, large tobacco shed, etc., with 77 acres of land. To be sold or leased on very favorable terms. Apply to F. I. MAYER, 159 Dayton street, Cincinnati, Ohio.

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